DOCUMENT RESUME

ED 042 054 08 VT 011 614

AUTHOR	Brewin, C. Edwin, Jr.; And Others
TITLE	Report on a Proposed Planning System for the New Jersey Division of Vocational Education.
INSTITUTION	New Jersey State Dept. of Education, Trenton. Div. of Vocational Education.; Pennsylvania Univ., Philadelphia. Government Studies Center.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO	BR-8-8055
PUB DATE	Feb 70
GRANT	OEG-0-8-088055-4650
NOTE	248p.
EDRS PRICE	EDRS Price MF-$1.00 HC-$12.50
DESCRIPTORS	*Decision Making, *Design Needs, Information Processing, *Program Budgeting, *Program Planning, *Statistical Data, Systems Concepts, Systems Development

ABSTRACT

Much of the misunderstanding concerning planning, programing, and budgeting stems from the lack of operational planning systems. However, such a system has been developed and field tested over the past 3 years in two counties and six school districts in Pennsylvania. Key concepts used in the system include forecasting, indicators, the status report, and project alternatives. These concepts have been modified and adopted for the recommended New Jersey Vocational Educational Planning system. The system is primarily concerned with planning decisions and only secondarily with management and operations decision processes. It provides a formalized, sequential process, functioning continuously during the planning cycle and incorporates planning subsystem procedures, indicator sets, forecast procedures, and data files and report generation procedures. (Author/JS)

REPORT ON A PROPOSED PLANNING SYSTEM FOR THE NEW JERSEY DIVISION OF VOCATIONAL EDUCATION

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February, 1970

ACKNOWLEDGMENTS

The cordial working relationship which developed between the staffs of the Government Studies Center, Fels Institute and the Division of Vocational Education makes the drafting of these acknowledgments a pleasure rather than an obligation. Our contacts and interviews with Division personnel in Trenton were invariably marked with frankness, ready assistance in providing information, and perceptive self-analysis. In a real sense, the personnel of the Division, from Assistant Commissioner Robert M. Worthington to the bureau and program heads, should be included as co-authors.

Participation by Division and other personnel of the New Jersey Department of Education in workshops on educational planning conducted by the Government Studies Center in Philadelphia, further improved understanding and enhanced communication on substantive issues. Thus, the Planning System proposed for the Division, and explained in this Report, is genuinely for the Division and not an unrelated management construct to be imposed on the current operation.

And in truth the individuals to be thanked could stretch for pages, forcing by name acknowledgment of only a few. Assistant Commissioner Robert M. Worthington was generous with his time and lucid in explaining his expectations about the type of planning system required by the Division. James E. Seager, coordinator of the study, was prompt and thorough in meeting our innumerable requests for information - and more

information. John H. Koenig, Morton Margules, and Stephen Poliacik - the Associate State Directors of the Division - were perceptive, understanding, and continuously cooperative at all stages. Bernard A. Kaplan, Director, Office of Planning, Division of Research, Planning, and Evaluation provided the critical connection with the total planning efforts of the Department of Education. William Brown, from the staff of the Division of Budget and Accounting, Department of Treasury, provided useful criticism during the final design stages of this Report. To these and all other staff members of the Division of Vocational Education, we acknowledge our debt and our thanks.

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ABSTRACT OF THE REPORT ON A PROPOSED PLANNING SYSTEM FOR THE NEW JERSEY DIVISION OF VOCATIONAL EDUCATION

Chapter I

Education Planning Systems - A Point of View

The body of literature concerning planning-programming-budgeting has become so complex to be almost incomprehensible to public officials seeking an understanding of PPB. Much of the confusion and misunderstanding stems from the lack of operational planning systems which can be analyzed by policy-making officials contemplating use of such systems.

The Government Studies Center (GSC) of the Fels Institute of Local and State Government has developed and field tested such a system over the past three years in two counties and six school districts in the Commonwealth of Pennsylvania. The Education-Planning-Programming-Budgeting System (EPPBS) is presented as background and introduction to the results which can be obtained from educational planning systems. Key concepts used in the EPPBS are also explained, including (1) the use of forecasts, (2) the use of indicators, indicator gaps, and the setting of objectives based on the desire to close the gaps, (3) the "base case" or status report and (4) the development of program and project alternatives in alternative sets. These and other EPPBS

concepts have been modified and adapted for the recommended New Jersey Vocational Educational Planning System.

Chapter II

The Setting - New Jersey Division of Vocational Education

Until very recent years, vocational education was one of this nation's most neglected educational missions, with attention to occupational training being sporadic, uncertain, and generally unrelated to regional economic problems and individual aspirations. Recognition as a national concern came with the Vocational Education Act of 1963, and the Amendments of 1968. Yet, even with increased resources, vocational education faces unique management problems and dilemmas in arriving at objectives and overcoming crucial program restraints.

The present Assistant Commissioner of the Division of Vocational Education entered the post in January, 1965 when the impact of Act of 1963 was being felt and the shift from a limited program orientation to new concern with construction of facilities, with research, and with program evaluation and administration was occurring. The vital economic ingredient in vocational education programs has been stressed in the highly industrialized State of New Jersey.

The Division's existing decision-making processes, information systems, and financial management - confronted with a virtual revolution in the purposes of and resources for

vocational education - have yet to be fully adapted to these broader management responsibilities. Certain deficiencies in each are noted. Yet, before undertaking development of a comprehensive planning system any public agency will legitimately ask - is there a need and does that need merit the investment required. Thus the justification for developing and implementing a vocational Educational Planning System is presented in terms of both external and internal factors bearing on the need.

In sum, the analysis presented suggests the need for a continuous, comprehensive, and integrated planning system for the Division: continuous because such a planning system would replace intermittent examinations of single revenue sources; comprehensive because the planning system would embrace all revenue sources administered by the Division; and integrated because the planning system procedures would permit examination of each revenue source in the context of all activities designed to achieve Division-wide objectives.

CHAPTER III

General Design Considerations

The Vocational Education Planning System is primarily concerned with planning decisions and only secondarily with management and operations decision processes, as these terms are explained. The Planning System provides a formalized, sequential process, functioning continuously during the Division's fifteen

month planning cycle, in which decisions on a given revenue source are made in the context of the total operation of the Division. The backbone of this planning process are the indicators - the main link between the program evaluation of the Division's operations and the planning decisions which alter these operations. Planning procedures are dependent on development of an effective data and information base, with related report generation procedures. Explicit links between the proposed Planning System for the Division and the planning system of the Department of Education as a whole are indicated.

An exhaustive examination of the revenue sources controlled by the Division, activity types funded by each revenue source, and financial constraints associated with some of these sources is presented.

Planning is explained as a cyclical process which requires formal planning procedures for each continuing revenue source, and more general procedures for the non-continuing sources. Timing for each revenue source is noted, decision-making is set in the context of previous decisions and knowledge of possible future decisions for all other revenue sources, and decision point and level reports are generated.

Three types of indicators are proposed and explained - Social Demand, Process, and Output. Examples of each are provided. Vocational programs and projects are undertaken to cause the expected level for an indicator to come as close as possible to the desired level set by Division policy. The

Planning System itself will produce information on present and expected indicator levels as a benchmark for the setting of desired indicator levels in the Division.

Input forecasts and projections are examined, recognizing that the need for better forecasting on any policy dimension must be justified, not assumed. Elements considered in justifying more sophisticated projections include (1) the range of programs and level of resources, (2) availability of proven models and methodology, (3) availability of data and information, and (4) recognizable and measurable benefit. Forecasts and projections for the following categories are discussed:

- Population and Client-Recipient Groups
- Manpower and Occupational Requirements
- Staff and Space Requirements
- Federal and State Revneues

Manpower and occupational forecasts are seen as having particular relevance to vocational educational planning, in that superior forecasting can enhance the competitive position of New Jersey for economic development. Because of the importance attached to projections anticipating occupational composition of the work force required to achieve defined economic goals, the methodologies of several leading manpower studies are reviewed.

Chapter IV

General Design and Logic of the Planning System

The general overlapping problem which the Division faces in planning each revenue source in the context of commitments made for all revenue sources is discussed. Three separate planning cycles that yield old, current, and new plans over a span of approximately six years are introduced.

Major components of the Planning System are (1) the Division and Revenue Source Planning Subsystem Procedures, (2) the Division and Revenue Source Indicator Sets, (3) the Forecast Procedures, and (4) Data and Information Files and Report Generation Procedures.

The General and the Detailed Flows of the total Planning Systems (Charts IV-B and IV-C) are explained with reference to the Base Case and Alternative Set Phases. An illustrative set of Data and Information Files are provided.

Chapter V

Work Program for the Development, Testing, Modification and Implementation of the Proposed Planning System

The work program discussed covers a three year period beginning July 1, 1970 and concluding June 30, 1973. In establishing the work program the following factors were controlling:

-the duration of the planning cycles of each of the continuing revenue sources and the place of each in the fifteen month planning cycle of the Division

-the time required to design the components of the Planning System and the necessity of taking each component through two complete implementation, evaluation, and modification cycles

-the value in providing most of the components of the total Planning System at the end of the first year of the project

The work program involves three phases and five task streams. The three Phases are July 1, 1970 - April 30, 1971, May 1, 1971 - April 30, 1972, and May 1, 1972 - June 30, 1973. The task streams involve development and implementation of (1) Forecast Procedures, (2) Report Generation Procedures, (3) Data and Information Files, (4) Indicator Sets, and (5) Planning Subsystem Procedures. A detailed phasing of the work program and the results at the end of each phase are explained.

As designed, the Work Program will provide all the components of the proposed Planning System thirteen months after the start of development, and a completely tested and operational system at the end of thirty-six months.

Chapter I

EDUCATION PLANNING SYSTEMS - A POINT OF VIEW

Discussions and explanations of planning-programming-budgeting (commonly abbreviated as PPB) have become so common, and so complex, as to be almost incomprehensible to those seeking an understanding of PPB. Much of the confusion stems from the incontrovertible fact that the vast proportion of articles, monographs, and books on the subject of PPB systems are semantic manipulations of budgetary concepts and developments, and <u>not</u> analyses of experience with operational systems. Lacking concrete examples of installed and field-tested planning-programming-budgeting systems (with some exceptions in the Federal experience), state and local officials contemplating use of PPB have been confronted with a potential fiscal shift based on faith not facts.

Experienced state and local officials have been engaged for years - and competently - in planning, program analysis, and budgeting for the full gamut of public services which this society provides its citizens. What, they ask, are we to do differently in employing PPB; what new factors are we considering; what new elements are we adding to a budgetary process replete with political implications; which interpersonal

relations carefully established will be jeopardized and, most essential, what results can be achieved in terms of meeting policy objectives within the limits of available resources?

No discourse, briefing, or written materials can adequately respond to these legitimate questions unless based on an operational system with results and output that the official can examine and digest in reaching a conclusion. It is not what PPB is, but what it produces that matters. With this considerable variation in statements of what PPB is, there have necessarily been differences in what the few existing operational systems have produced in the way of output. But the policy making official, whether in education or other public policy areas, <u>can</u> evaluate an operating system; even the most perceptive official <u>cannot</u> judge, however, the potential management benefits of an explanation of a new stage in the evolution of planning and budgetary techniques.

In designing a Planning System for the New Jersey Division of Vocational Education, detailed and explained in this report, the Government Studies Center (GSC) of the Fels Institute has adapted concepts, techniques, and elements of a fully operational and tested PPB system which GSC designed particularly for educational organizations. An explanation of the Education-Planning-Programming-Budgeting System (EPPBS) is presented here; it serves as background and introduction to the results that can be obtained from a fully developed planning system.

While the full complexity of the EPPBS cannot be described, a general understanding of the concepts, techniques, and elements of the system can be obtained from this overview. Enough information is presented to provide a clear picture of how the system operates, how it assists educational policy makers, and what results or output it provides.

The EPPBS described here relates to school district procedures but has definite conceptual and technical parallels in the recommended planning system for the Division of Vocational Education. Key notions that should be understood from this overview of the EPPBS include the use of (1) forecasts, (2) indicators, indicator gaps, and the setting of objectives, (3) program structure and the crosswalk, (4) the base case or status report, (5) the distinction between programs and projects, (6) the design and selection of project alternatives, (7) multi-year planning of programs and projects, and (8) development of the annual budget for the next year.

The Study

The EPPB System is the product of a three year ESEA, Title III study. In 1967, The Pennsylvania Department of Education encouraged Bucks, Cameron, Elk, McKean, and Potter Counties superintendents of schools' offices and the 27 school districts in these counties to develop a planning-programming-budgeting

Special impetus for the study came from the possibility that intermediate units or regional education service agencies would be established in Pennsylvania.

These counties contracted with the University of Pennsylvania to provide the technical design. The Government Studies Center of the Fels Institute, Management Science Center of the Wharton School, and Graduate School of Education all contributed. Pennsylvania Department of Education and Research For Better Schools, Inc. assisted in the development of the System.

EPPBS has been successfully tested in six school districts and two county offices. The superintendent and staff in these educational units have found the system most helpful in defining objectives, developing programs, planning revenues, preparing budgets, and in presenting the results to the boards.

The System and The Need

Educational units - school districts, intermediate units and state departments of education - are being pressed to justify their allocation of resources. The Education-Planning-Programming-Budgeting System (EPPBS) has been developed to provide a rational basis for selecting programs and projects which will fully utilize resources to accomplish educational objectives.

EPPBS is a series of specific procedures and decision processes for annual use, which, when properly executed, permit the evaluation of alternatives against specific educational criteria. It encourages consideration of long-range consequences of this year's decisions. The Education-Planning-Programming-Budgeting System (EPPBS) employs planning procedures which incorporate proven techniques developed over the last 25 years for assisting in the process of planning and budget construction.

Planning-Programming-Budgeting

An examination of the general process decision-makers follow in guiding a school district will serve as a useful starting point. Figure I-A shows the basic information flows in this process. The decision-makers -- the board and superintendent -- attempt to operate the schools so that the educational requirements or objectives of the community are satisfied. Sometimes these objectives are explicitly stated. Often they are communicated informally to and through the board, but explicated or not, they exist. The decision-makers' outputs are decisions. These are detailed by staff to produce operating directives -- both oral and written and both formal and informal -- to guide the operation of the school district. A main result of the decision making process is the budget.

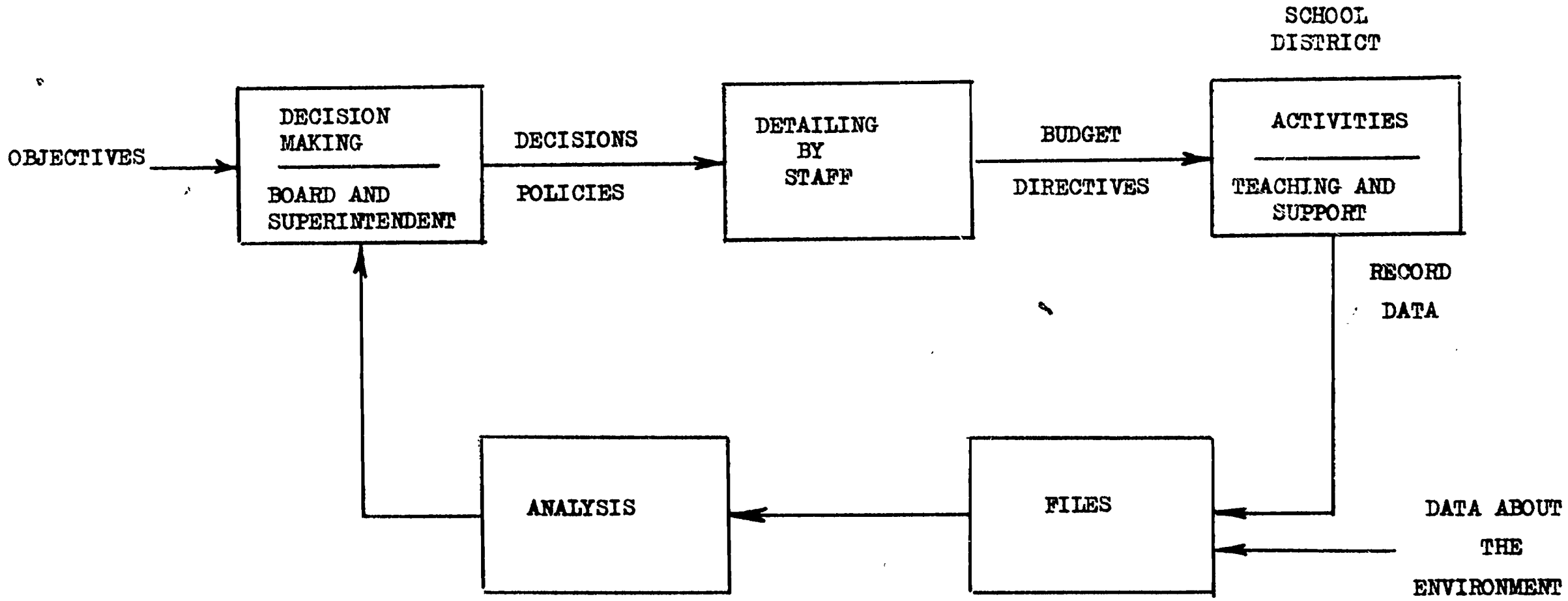


Fig. 1-a. **Information Flows in a school district.**

The decision-makers must have information about what is going on in the various activities so that they can detect deviations from desired results and so that they can properly motivate the staff to make appropriate adjustments to achieve the desired results. This requires a feedback path shown at the bottom of Figure I-A. Data about the system are recorded and filed. The files are a convenient "memory for the organization". Data in the files, however, is not very meaningful, since it consists of a large number of individual records. Therefore, this data must be analyzed in order that it be placed in a form which the decision-makers can interpret in relation to the objectives of the school district.

One important example of this information cycle is the budget. The budget is really the result of a series of decisions made annually by the board and superintendent. The budget decisions are detailed by the staff. The detailed budget is the authorization for the school district to carry on various activities. Thus the budget is a key device for implementing policy and for directing activities.

In establishing the budget the decision-makers must determine which activities should be authorized to move the school district toward its objectives. Budget decisions must be supported by two kinds of analyses. First, data about the school district and about the world in which the school district exists must be analyzed in order to understand the present status of the

district and the nature of the community it serves. Secondly, various ways in which the school district could operate must be studied and predictions must be made concerning the influence various possible activities will have on the desired objectives.

Planning-programming-budgeting is a method for performing these two kinds of analyses in preparation for establishing an annual budget.

Objectives and Indicators

Good planning is directed toward choosing those activities which accomplish the desired objectives. Therefore, it is important to understand what an objective is and how progress toward it is measured. In EPPBS the device for handling objectives is the indicator. An indicator is a measure of a resource input to or an output from the school district. An indicator must be quantifiable, that is, some definite procedure must be available which tells what information and data to record and how to manipulate it so as to produce a number which represents the indicator.

Figure I-B shows typical indicators and illustrates their uses. Four indicators are shown. Two measure resource inputs and provide part of the basis for examining the level of resources in terms of the desired benefits and effects to be achieved. These indicators are: (1) total dollars expended per

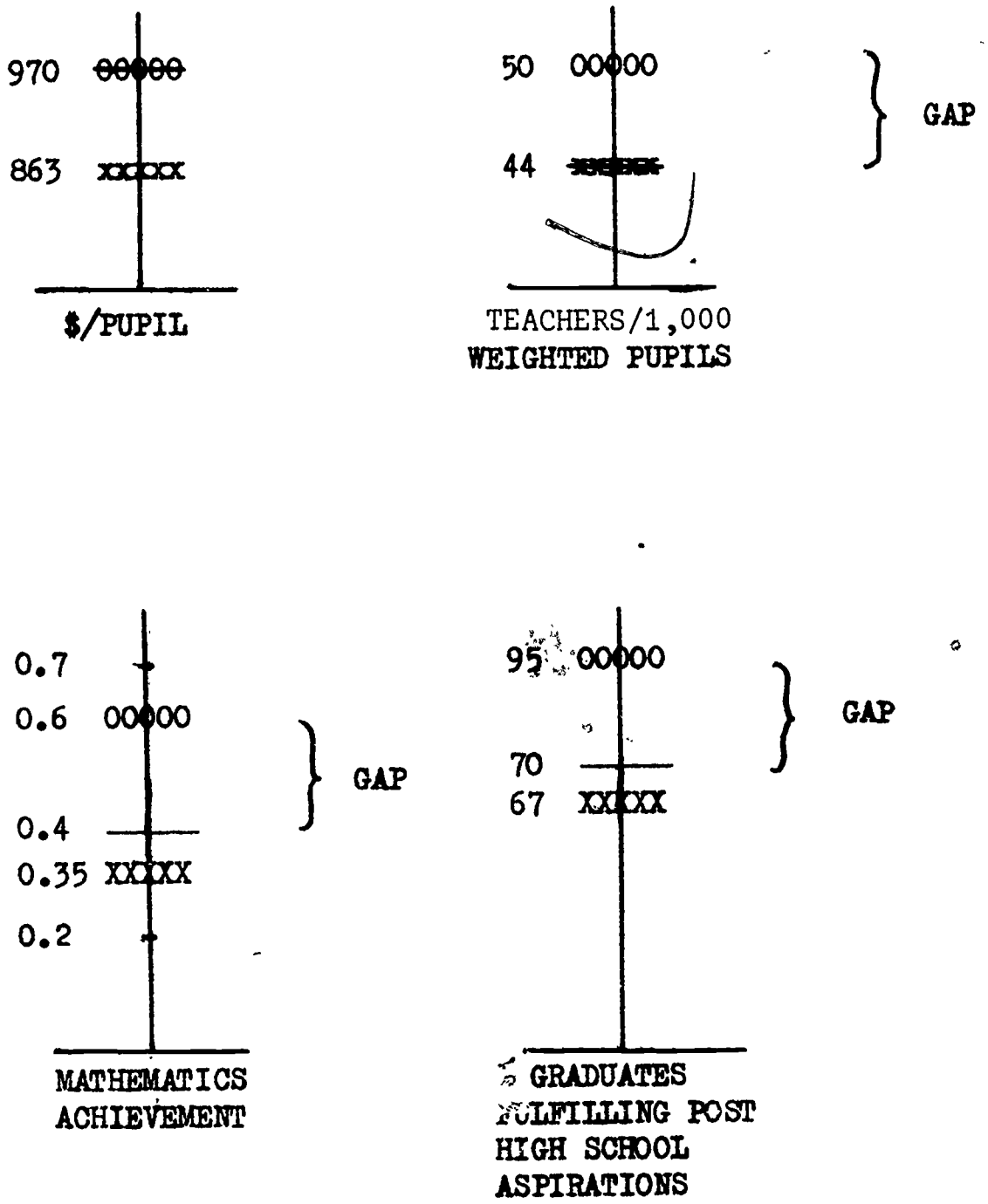


Fig. 1-b. Typical indicators and a graphic illustration of their uses.

pupil and (2) classroom teachers per thousand weighted pupils. The other two indicators are output indicators and measure the performance of the school district. These indicators are: (1) achievement in mathematics (average deviation from national norms in a standardized achievement test) and (2) the percent of high school graduates who are successful in pursuing their expressed interests in post high school education.

An examination of the mathematics achievement indicator will be useful at this point. The present level of the indicator is developed by giving each pupil a mathematics achievement test appropriate to his grade. These tests are then scored relative to national norms in terms of equivalent grade level. The average deviation of the school district scores from national norms are then taken. The hypothetical school district shown on Figure I-B scored an average of 0.35 of a year above the national norms. Two other critical points are shown on the scale. First, there is an estimate of what the mathematics achievement will be five years from now if no modifications are made to the present mathematics program. Second, the desired level is shown -- 0.6 of a year. The estimated and desired levels are determined by the superintendent and board, with appropriate consultation with the staff and curriculum experts. The community may, at times, be involved in helping set the desired levels. The exact method of consultation with the community depends upon the way in which the community interacts with the board and superintendent.

The difference between the five-year estimated and the desired level is called the gap. An objective is to close the gap, in other words, to undertake acitivties which will cause the estimated mathematics achievement level at some specific future point in time (a five-year period is used in EPPBS) to come as close as possible to the desired level.

It is presumed that a real school district will have a number of indicators, many of which will have gaps. It is unreasonable to expect a district to attempt to close all of the gaps in any one multi-year period. Therefore, it is necessary to establish priorities. At the very least, the board and superintendent, with the assistance of the staff and community, should rank the gaps to show which ones they believe should be closed first. In other words, the objectives are ranked in priority order.

Thus, the purpose of EPPBS is to assist the decision making group in choosing the most desirable changes to be undertaken in the school district -- innovations, new projects, changes in resource levels, or reduced programs -- so as to close the gaps in priority order within acceptable expenditure and reasonable manpower levels. The results of these decisions are then reflected in the annual budget.

The Basic Flow in the EPPB System

Figure I-C illustrates the basic process by which decision-makers choose the preferred course of action. Data are prepared about the present status of the school district and the community. Included in the data preparation are estimates of enrollment over the next five-year period and estimates of revenue factors, such as property market value and subsidy levels, which provide the basis for estimating the anticipated revenue for the same period. From the previous year's planning, information is collected about the current policies and programs and projects under way in the school district. All of these data are then fed into the basic (partially computerized) procedures. The procedures provide two kinds of output: (1) estimates of indicator levels under a proposed plan of operation (set of programs and projects) and (2) estimates of the revenue required to operate the plan. These outputs are evaluated by the decision-makers. If they feel that this plan is satisfactory it can be adopted and a detailed budget prepared. If, however, it is not satisfactory, then the board and superintendent can do one of two things. They can try different combinations of activities already designed or they can call for the design of new projects and add them into the plan. Basically, EPPBS is a forecasting tool which lets decision-makers see the probable consequences of plans of operation in terms of indicators (which show the

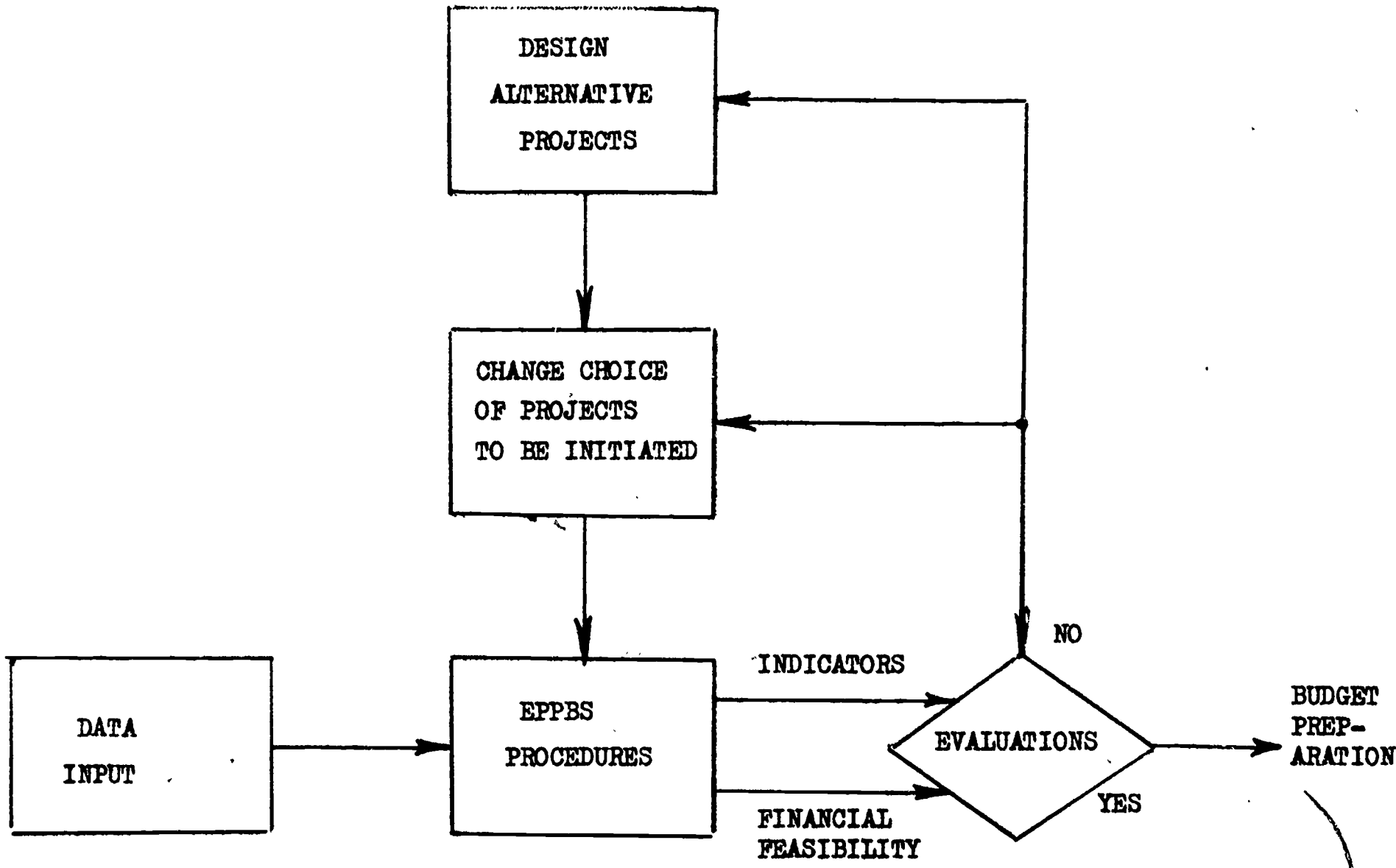


Fig. 1-c. The basic process by which decision-makers choose the preferred course of action.

benefits and effects derived) and financial factors (which measure the costs).

Figure I-D shows the basic EPPB System flow in more detail. There are two kinds of input data -- forecasts and status data. Forecasts are made of future enrollment levels by grade level -- early childhood, elementary, secondary, etc. Also, forecasts are made of anticipated revenues.

The status of the school district is determined principally by an analysis of the past year's operation. An analysis of the expenditures is performed. These expenditures will have been collected by the normal accounting procedure and recorded by expenditure category. In order to facilitate planning it is desirable to aggregate costs by programs and projects. A program or project is simply a classification of activities which is useful to the decision-makers in planning. The typical budget is organized to provide control over the expenditure of money rather than to facilitate decision-making. To convert the expenditure categories into the program and project classifications a crosswalk is used. This is a method of allocating the amounts in each expenditure category to the program and project categories. An analysis of the evaluations of the results of last year's programs and projects and an examination of present indicator levels is also undertaken. Data for the status report are derived from financial and other operational reports and from achievement and performance tests administered to the pupils.

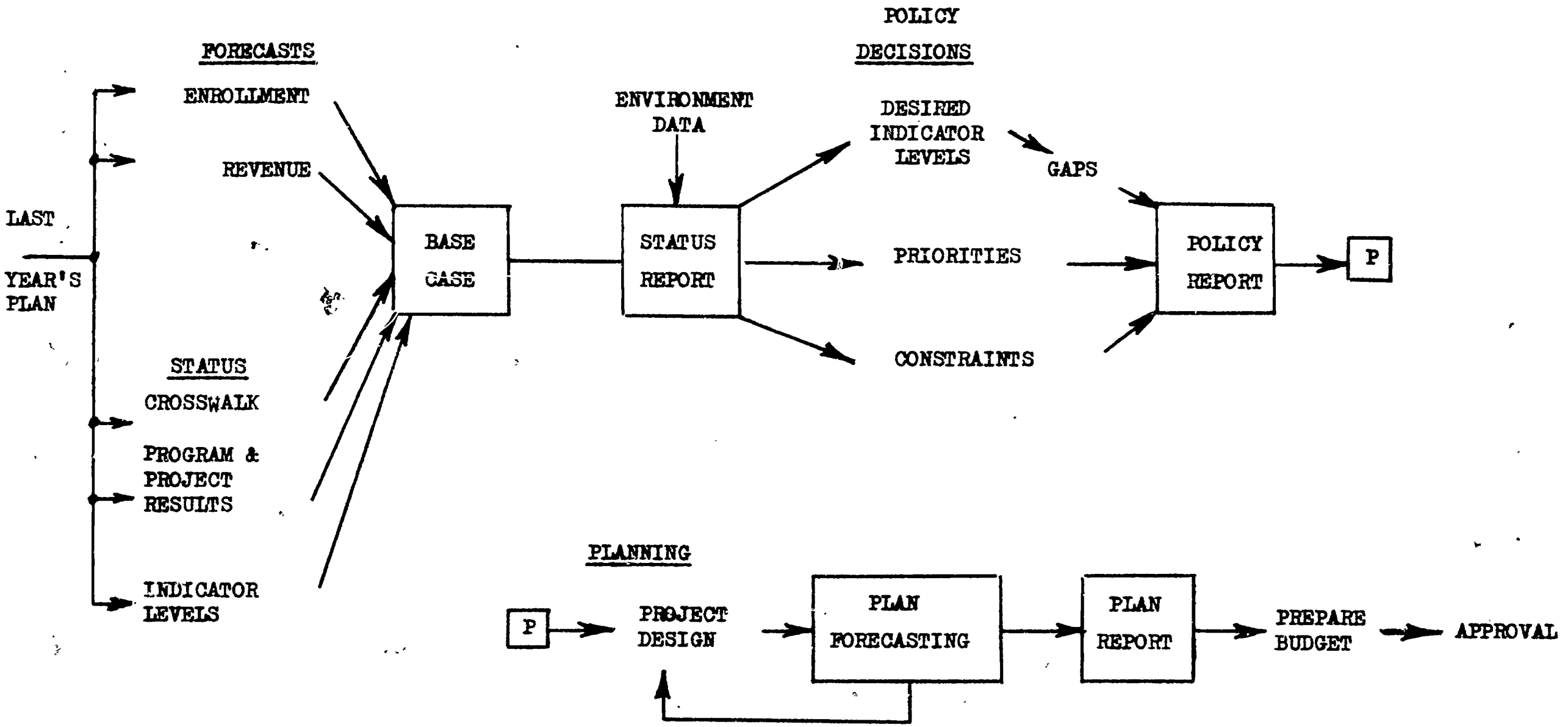


Fig. 1-d. The basic EPPB System Flow.

These data and information are then used to produce the base case. The base case is a projection of indicator levels, costs and manpower requirements, and a determination of financial feasibility under the assumption that no new planning decisions will be made for the next five-year period. Previous policies remain in force and programs and projects will continue as planned the previous year. The output of the base case computations, which will be illustrated below, provide a baseline of the operations of the school district. Additions to and subtractions from this baseline will be made for the purpose of examining various alternatives for improving the operation of the school district. The data in the base case along with the relevant environmental data and information are interpreted to the board by means of the Status Report.

At this point the board and superintendent define the objectives of the school district. Specifically, they determine what new problems face the school district and what new objectives and indicators should be established. Data for the new indicators are prepared. The decision-makers set desired levels for all indicators -- levels which they would like to attain in the next five years. This of course defines the gaps -- the difference between the desired and the predicted levels in the base case. They then set priorities in terms of these gaps, i.e., which are the most important to close. Also at this time the board and superintendent establish certain constraints within

which improvements must be made. For example, they might limit the rate at which building construction can proceed. All of these decisions are reflected in the Policy Report.

Next, members of the school district staff are given the task of designing projects which will help attain some of the objectives -- close the indicator gaps.

At this point the distinction between programs and projects can be sharpened. In the EPPB System the school district is viewed as having two kinds of activities for convenience in planning. One kind is called a program, such as elementary education or health services. Programs are sets of continuing activities which have long been established and which will continue unless some specific actions are taken to reduce or change them. It is necessary to forecast the results of these programs, but it is assumed that, except as noted below, they are continuous. New activities are called <u>projects</u>. A project may become continuous and, hence, become an additional program or it may be of limited duration. It may be innovative or traditional. It is singled out as a project primarily because management wishes to keep track of its costs, operational progress, and its influence on indicators. Thus, most improvements in the school district that are required to close the indicator gaps are brought about by designing specific projects. These may be remedial projects dealing directly with pupils, in-service

projects for staff improvement, or projects for business support activities.

After the projects have been designed, the process of selection begins. EPPBS now truly enters the planning stage. The same kind of computational procedures used for the base case are repeated except that new projects in various combinations are added. Some of the projects might have negative quantities so that these cause reductions in existing programs or in previously approved projects. A combination of projects is called a project set. A project set combined with the existing programs forms a plan. The impact of this plan over the five-year period is forecast to give estimates of indicator levels and the expenditure and manpower requirements. The financial feasibility of the plan is examined in terms of the anticipated revenues. Thus, a number of plans are produced and examined -- some of which cost more and some less but each has a different consequence on the indicators. From among these plans a preferred plan is chosen -- the one which is financially feasible and which increases the high priority indicators as much as possible. This plan is described in the Plan Report. From this information the annual budget is prepared for approval.

Key Steps in the EPPB System

A detailed examination of the key steps in the EPPB System is developed in the following sections of this paper.

Enrollment Forecasting

The entire plan for a school district must be based on a reasonably sound estimate of the enrollment by grade level over the five-year planning period. EPPBS contains an enrollment forecasting computer program to assist in making this estimate. The basic principle of the forecasting program is illustrated in Figure I-E. Factors are derived from a historical study which are utilized in measuring the reduction in population in a static area. This is represented by the dashed curve. Increases in school age population are assumed to be largely result from new housing. Therefore, a second set of factors is derived for the enrollment forecast, i.e., estimates of housing that will be constructed over the next five-year period are secured. These are deduced from past trends and other information concerning future housing construction. The combination of these two factors gives an estimate of population by age. This estimate is then converted into enrollment by grade using another set of factors which give age distribution by grade level.

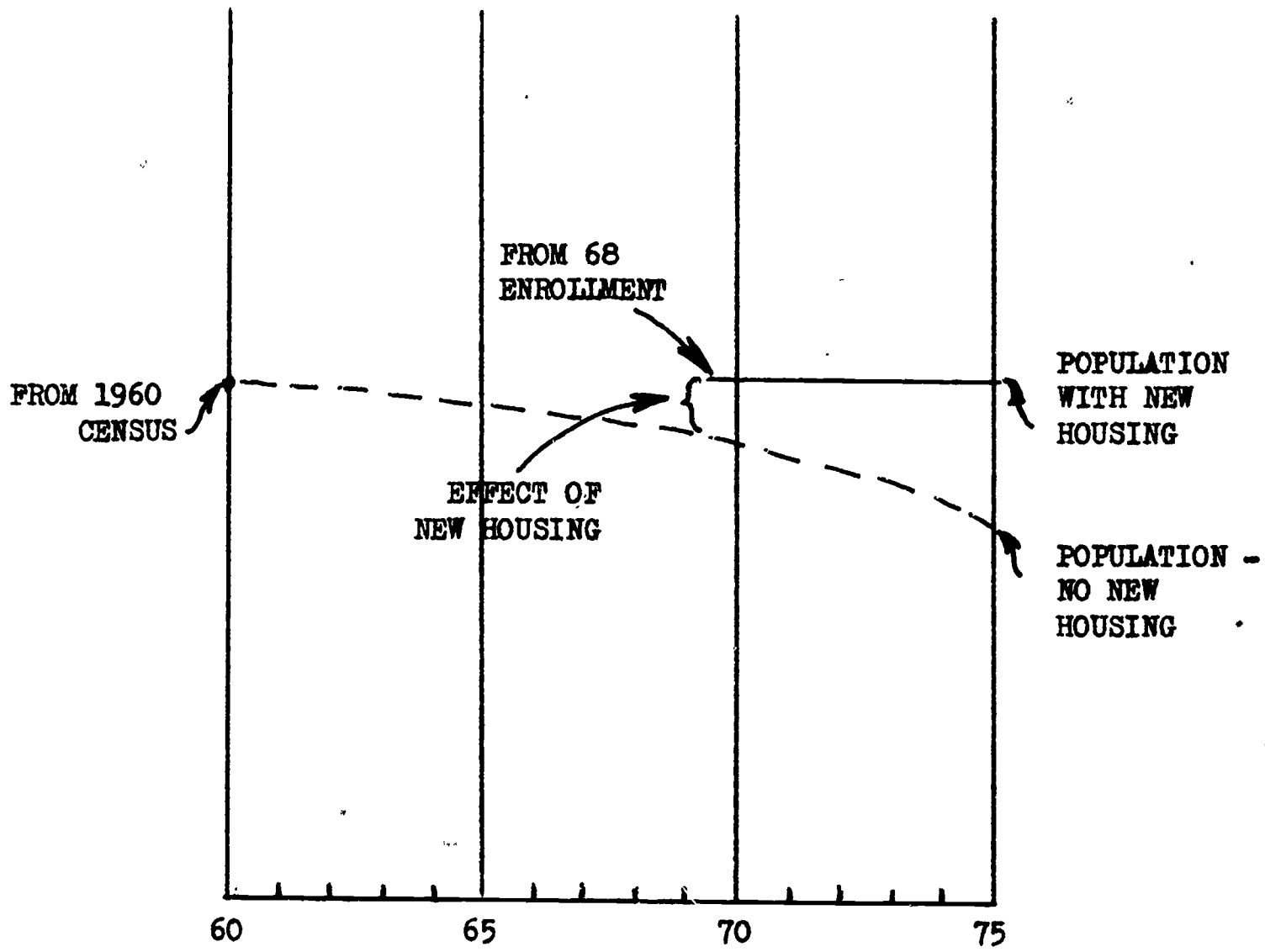


Fig. 1-e. The basic principles for forecasting enrollment.

Revenue Forecasting

The procedure for estimating revenues varies with the source and the information and data available on the source. The main sources, property taxes and state subsidies, are calculated in the main EPPBS cost estimating computer program. Property taxes are estimated by first forecasting future property market values and future assessment ratios. Often this is done by assuming a linear trend. Then revenues are computed by applying the tax rate to the property value and adjusting for non-collections and other miscellaneous factors. State subsidies are calculated according to the current rules unless there is some specific reason to believe the rules will be changed. Other revenues are estimated on a special basis by the planning staff.

Crosswalk

Planning is performed on the basis of programs and projects in EPPBS. These are the categories by which various costs are accumulated. In most school districts, costs are accumulated according to expenditure categories, such as salaries and materials. The latter accounting procedure has been established because of fiduciary concerns, i.e., insuring that no unauthorized expenditures are made. The program and project categories are designed to facilitate planning and are not designed to aid in fiduciary control.

Therefore, it is necessary to translate the costs which have been accumulated by the normal accounting system into the program and project categories. This can be done in three ways:

1. It can be done on an ad hoc basis every time a particular program or expenditure is studied. This could be very time consuming.
2. The entire accounting system can be changed so that all expenditures are coded by program or project as well as by account number. This ultimately is the best method of keeping track of program and project expenditures, but it requires the expensive step of redesigning the accounting system and, probably, going to a computer-based system to handle the added data processing.
3. Use of a crosswalk to translate account costs into program and project costs at the start of the planning effort. It is the best compromise if one wishes to use the planning system quickly. However, it does require some subjective judgment, and, hence, there is room for error.

Figure I-F shows a typical crosswalk. On the left are the standard expenditure accounts and the amount accumulated in each. Across the top are the various program categories. (Projects are not shown on the Figure.) The problem is to allocate the expenditure account costs to the various programs. In some cases this can be done by means of a numerical procedure. For example,

Expenditure Accounts		Amount	Comp. Planning	Ec. Inst.	Elem. Inst.	Sec. Inst.	Spec. Inst.	Inst. Supp.
0211	Princ.	$329	-	-	-	-	-	$329
02130	Teachers	5,318	-	$234	$2,334	$2,617	$133	-
02131	Teachers Aid	26	-	-	-	-	-	26
⋮								
01135	Computer Personnel	28	$27	-	-	-	-	1
⋮								
Program Totals			-	-	-	-	-	-

Fig. 1-f. Crosswalk -- a method of transferring amounts in budget accounts to program categories.

salaries can be fully allocated to various instructional programs according to the assigned position of each teacher or by proportion, i.e., computer personnel whose salary costs are prorated between Comprehensive Planning and Instructional Support. The latter procedure is, obviously, more difficult. Theoretically this latter procedure should be based on a careful accounting of the time which computer personnel spend in various activities. However, for the purposes of planning, estimates can be made according to the judgment of personnel familiar with the work schedules of the computer personnel.

Base Case

After all of the input data has been gathered, enrollment and revenue estimates made, and the crosswalk prepared, the next step in the EPPB System is to compute the base case. The base case is a forecast of what will happen if the school district continues to operate for the next five-year period according to the decisions made last year. All projects which were operating or planned for initiation during last year's five-year period and all programs are included in the base case. The base case computations produce several reports: (1) estimate of the costs of operations; (2) estimate of manpower required; (3) estimates of the indicator levels that will be obtained with the programs and projects as they are presently operating; (4) estimate of the anticipated revenue; and (5) a determination of the financial

feasibility of the base case set of programs and projects. Thus, the base case serves as a baseline for planning. Planning will consist of determining what to add or subtract from the base case in order to more nearly attain the objectives of the school district.

The development of the EPPB System is based on the adoption of a particular form of planning. There are basically three planning approaches that could be utilized:

1. Incremental expenditures - the plan is derived by adding or subtracting the expenditures to each budget account. This is the normal method by which budgets are prepared. Each organizational sub-division adds (rarely does it subtract) some amount to its salary, materials, equipment, travel, and other accounts. The sum of these increments is computed. If the budget looks too high, arbitrary cuts are made, normally from the increments and not from the current level of expenditures. The difficulty with this kind of planning is that it is not related to the objectives of the school district.

2. "Start-from-scratch" planning - this is the kind of planning implied by theoreticians. They say that each year one starts as if there was no prior plan and, hence, no prior commitments. Therefore, planning consists of considering and selecting only those new

combinations of activities that would best accomplish the objectives of the school district. This kind of planning would be suitable if one could truly evaluate the cost of stopping existing combinations of activities and starting new ones, i.e., transition costs. There is, of course, a significant cost in changing any combination of activities: for example, the costs for retraining and recruiting personnel. It is, however, almost impossible to evaluate these transition costs. Therefore, EPPBS uses a third method of planning.

3. Incremental planning by project - in this form of planning, the base case is the starting point and projects are added or subtracted. This form of planning automatically takes into account the value of continuity, since it uses the base case as a baseline for planning. It is objective oriented, because the projects are evaluated on the basis of their relative contribution to closing the indicator gaps.

In the base case computations, two kinds of data are produced: cost forecasts and indicator level forecasts. The former are calculated by a formal cost estimating model. Resource input indicators, such as teachers per 1000 weighted students, are also calculated. Estimating output indicators, such as mathematics achievement, is more difficult. Formal

computation of the output indicator levels would have to be based on a valid, quantitative learning theory that is not presently available. Therefore, in the EPPB System output indicator levels are estimated subjectively by experts using a carefully controlled procedure. Every effort is made to eliminate bias due to political, personal, or financial considerations. Consequently the experts are placed in a better position to give their best judgments. These judgments are entered into the System so that the output reports for the base case, and later for the five-year plans, contain complete information, including all indicator levels. The fact that the computer prints the performance estimates should not obscure the fact that the levels are obtained subjectively.

The base case computations produce the outputs shown on print-out pages 17, 18, 19, 20, 23 and 24. (Three regular size pages are required to show page 17.) These computations were performed on the IBM 360/75 at the University of Pennsylvania's Computer Center. With minor changes, the programs will run on smaller computers, such as the IBM 360/30. The most important outputs are the extent to which indicator gaps will be closed, as shown on print-out page 20, and the overall revenue requirements, expressed as tax rate increases, as shown on print-out page 24.

Special base case studies can be made. It is possible to estimate the cost, revenues and indicator levels under varying environmental conditions; i.e., different enrollment forecasts,

PROGRAM COSTS

		CY	Y1	Y2	Y3	Y4	Y5
POLICY AND EXECUTIVE	S	33170.00	35491.89	37976.28	40634.59	43478.97	46522.48
	NS	0.0	0.0	0.0	0.0	0.0	0.0
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	33170.00	35491.89	37976.28	40634.59	43478.97	46522.48
COMPREHENSIVE PLANNING	S	43360.00	46395.18	49642.79	53117.75	56835.94	60814.43
	NS	0.0	0.0	0.0	0.0	0.0	0.0
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	43360.00	46395.18	49642.79	53117.75	56835.94	60814.43
INFORMATION AND LIAISON	S	26140.00	27969.79	29927.64	32022.55	34264.10	36662.57
	NS	0.0	0.0	0.0	0.0	0.0	0.0
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	26140.00	27969.79	29927.64	32022.55	34264.10	36662.57
COMMUNITY SERVICES	S	55583.00	59473.79	63636.89	68091.37	72857.75	77957.75
	NS	11920.00	12277.59	12645.91	13025.28	13416.02	13818.50
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	67503.00	71751.37	76282.75	81116.62	86273.75	91776.25
COORDINATE SUPPORT SERVICES	S	68080.00	72845.56	77944.62	83400.75	89238.69	95485.37
	NS	92049.00	94810.44	97654.62	100584.19	103601.62	106709.62
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	160129.00	167656.00	175599.25	183984.94	192840.31	202195.00
EARLY CHILDHOOD INSTRUCTION	S	235946.00	277505.19	285612.50	294585.69	312939.31	324238.37
	NS	20633.00	24204.14	25339.58	26200.12	27503.07	28690.26
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	256579.00	301709.31	310952.06	320785.75	340442.37	352928.62
ELEMENTARY INSTRUCTION	S	2094176.00	2353870.00	2504364.00	2660737.00	2830778.00	3015125.00
	NS	136125.00	150173.81	159009.37	168141.37	177652.75	187662.12
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	2230301.00	2504043.00	2663373.00	2828878.00	3008430.00	3202787.00
SECONDARY INSTRUCTION	S	2642023.00	2942491.00	3181939.00	3467176.00	3779790.00	4111755.00
	NS	182729.00	198334.06	213024.37	233438.19	252728.37	272857.87
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	2824752.00	3140825.00	3403963.00	3700614.00	4032518.00	4384612.00
VOC.-TECH. INSTRUCTION	S	0.0	0.0	0.0	0.0	0.0	0.0
	NS	112626.00	122191.62	132628.06	143990.87	155916.19	168427.44
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	112626.00	122191.62	132628.06	143990.87	155916.19	168427.44
SPECIAL INSTRUCTION	S	134060.00	187664.81	201524.75	208871.19	225439.69	243735.75
	NS	7175.00	7858.79	8434.56	9037.80	9669.65	10331.28
	CO	0.0	13000.00	0.0	0.0	0.0	0.0
	T	141235.00	208523.56	209959.31	217908.94	235109.31	254067.00
CONTINUING INSTRUCTION	S	0.0	0.0	0.0	0.0	0.0	0.0
	NS	1850.00	1905.50	1962.66	2021.54	2082.19	2144.65
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	1850.00	1905.50	1962.66	2021.54	2082.19	2144.65
INSTRUCTIONAL SUPPORT SER.	S	1593407.00	1772245.00	1896298.00	2029039.00	2171069.00	2323043.00
	NS	238765.00	266835.19	280567.62	300578.94	321685.81	343695.37

	CO	85390.00	85390.00	85390.00	85390.00	85390.00	85390.00
	T	1917562.00	2124470.00	2262255.00	2415007.00	2578144.00	2752128.00
NURSING	S	161655.00	172970.75	185078.50	198033.87	211896.06	226728.69
	NS	0.0	0.0	0.0	0.0	0.0	0.0
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	161655.00	172970.75	185078.50	198033.87	211896.06	226728.69
MEDICAL	S	9670.00	11023.72	12261.58	13634.09	15146.23	16798.87
	NS	7184.00	7878.15	8441.77	9043.87	9678.94	10341.17
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	16854.00	18901.87	20703.35	22677.96	24825.17	27140.04
DENTAL	S	3250.00	3704.97	4121.00	4582.29	5090.51	5645.95
	NS	348.00	381.63	408.93	438.09	468.86	500.94
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	3598.00	4086.60	4529.93	5020.39	5559.37	6146.88
PSYCHOLOGICAL	S	2000.00	14640.00	15664.79	16761.30	17934.59	19189.99
	NS	0.0	5000.00	5150.00	5304.49	5463.62	5627.52
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	2000.00	19640.00	20814.79	22065.80	23398.21	24817.52
HEALTH SUPPORT SERVICES	S	3034.00	3246.38	3473.62	3716.77	3976.94	4255.32
	NS	8362.00	8612.86	8871.23	9137.36	9411.47	9693.82
	CO	1267.00	1267.00	1267.00	1267.00	1267.00	1267.00
	T	12663.00	13126.23	13611.86	14121.13	14655.41	15216.14
GENERAL SERVICES	S	92459.00	98931.06	105856.12	113266.00	121194.50	129678.06
	NS	20110.00	20713.29	21334.67	21974.70	22633.91	23312.92
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	112569.00	119644.31	127190.75	135240.69	143828.37	152990.94
PUPIL TRANSPORTATION	S	327513.00	350438.44	374968.81	408133.87	458908.00	506871.25
	NS	127878.00	131714.25	135665.56	142230.69	154207.87	164128.50
	CO	750.00	750.00	750.00	8750.00	24750.00	16750.00
	T	456141.00	482902.69	511384.37	559114.56	637865.87	687749.75
FOOD SERVICES	S	0.0	0.0	0.0	0.0	0.0	0.0
	NS	37400.00	41013.72	43947.96	47082.51	50388.68	53836.29
	CO	8077.00	8077.00	8077.00	8077.00	8077.00	8077.00
	T	45477.00	49090.72	52024.96	55159.51	58465.68	61913.29
FACILITIES	S	711952.00	774481.19	828693.75	886701.81	948770.06	1015183.50
	NS	497874.00	525290.06	540028.06	555208.50	570844.31	586949.50
	CO	32834.00	32834.00	32834.00	32834.00	32834.00	32834.00
	T	1242700.00	1332605.00	1401555.00	1474744.00	1552448.00	1634967.00
FIXED CHARGES	S	632710.00	706841.44	757512.62	812466.31	875117.44	941063.56
	NS	54247.00	54247.00	54247.00	54247.00	54247.00	54247.00
	CO	0.0	0.0	0.0	0.0	0.0	0.0
	T	686957.00	761088.44	811759.62	866713.31	929364.44	995310.56
BUSINESS SUPPORT SERVICES	S	51310.00	54901.68	58744.73	62856.82	67256.69	71964.62
	NS	39375.00	40556.24	41772.89	43026.04	44316.77	45646.27
	CO	10847.00	10847.00	10847.00	10847.00	10847.00	10847.00
	T	101532.00	106304.87	111364.56	116729.81	122420.44	128457.87
TOTAL ABOVE	S	8921538.00	9967125.00	10682235.00	11457823.00	12341977.00	13272712.00
	NS	1596650.00	1713997.00	1793132.00	1884710.00	1985910.00	2088616.00
	CO	139165.00	152165.00	139165.00	147165.00	163165.00	155165.00
		10657353.00	11833285.00	12614531.00	13489695.00	14491057.00	15516497.00

DEBT SERVICE	1639464.00	1639464.00	1639464.00	1639464.00	1639464.00	1639464.00
TOTAL COST *	12296817.00	13472749.00	14253995.00	15129159.00	16130521.00	17155952.00
	(CY)	(Y1)	(Y2)	(Y3)	(Y4)	(Y5)

*Total cost of running the school district for the next five years.

MANPOWER (FULL-TIME EQUIVALENTS)

		CY	Y1	Y2	Y3	Y4	Y5
PROFESSIONAL ADMINISTRATION	P *	9.00	9.00	9.00	9.00	9.00	9.00
TURNOVER RATE 2.0	H *	0.18	0.18	0.18	0.18	0.18	
PRINCIPALS	P	25.00	25.00	25.00	25.00	25.00	25.00
TURNOVER RATE 5.0	H	1.25	1.25	1.25	1.25	1.25	
TEACHERS - EARLY CHILDHOOD	P	24.00	28.00	28.00	28.00	29.00	29.00
SEE INDICATOR 7	H	7.36	3.92	3.92	4.92	4.06	
TEACHERS - ELEMENTARY	P	239.00	256.00	264.00	271.00	278.00	285.00
SEE INDICATOR 7	H	50.46	43.84	43.96	44.94	45.92	
TEACHERS - SECONDARY	P	307.00	324.00	341.00	359.00	378.00	396.00
SEE INDICATOR 7	H	59.98	62.36	65.74	69.26	70.92	
TEACHERS - VOC.-TECH.	P	0.0	0.0	0.0	0.0	0.0	0.0
SEE INDICATOR 7	H	0.0	0.0	0.0	0.0	0.0	
TEACHERS - SPECIAL	P	13.00	18.00	19.00	19.00	20.00	21.00
SEE INDICATOR 7	H	6.82	3.52	2.66	3.66	3.80	
TEACHERS - CONTINUING	P	0.0	0.0	0.0	0.0	0.0	0.0
SEE INDICATOR 7	H	0.0	0.0	0.0	0.0	0.0	
INSTRUCTIONAL SPECIALISTS	P	104.00	110.00	110.00	110.00	110.00	110.00
TURNOVER RATE 2.0	H	8.08	2.20	2.20	2.20	2.20	
NURSES	P	18.00	18.00	18.00	18.00	18.00	18.00
TURNOVER RATE 2.0	H	0.36	0.36	0.36	0.36	0.36	
PSYCHOLOGISTS	P	0.0	1.00	1.00	1.00	1.00	1.00
TURNOVER RATE 2.0	H	1.00	0.02	0.02	0.02	0.02	
CLERICAL PERSONNEL	P	75.00	79.00	79.00	79.00	79.00	79.00
TURNOVER RATE 20.0	H	19.00	15.80	15.80	15.80	15.80	
OPERATIONS PERSONNEL	P	134.00	138.50	138.50	138.50	138.50	138.50
TURNOVER RATE 2.0	H	2.18	2.77	2.77	2.77	2.77	
MAINTENANCE PERSONNEL	P	21.00	21.00	21.00	21.00	21.00	21.00
TURNOVER RATE 2.0	H	0.42	0.42	0.42	0.42	0.42	
BUS DRIVERS	P	58.00	58.00	58.00	59.00	62.00	64.00
TURNOVER RATE 15.0	H	8.70	8.70	9.70	11.85	11.30	
FOOD SERVICE PERSONNEL	P	0.0	0.0	0.0	0.0	0.0	0.0
TURNOVER RATE 2.0	H	0.0	0.0	0.0	0.0	0.0	
ADMINISTRATIVE STAFF	P	7.00	7.00	7.00	7.00	7.00	7.00
TURNOVER RATE 2.0	H	0.14	0.14	0.14	0.14	0.14	
TOTAL POSITIONS		1034.00	1092.50	1118.50	1144.50	1175.50	1203.50
TOTAL HIRES		170.93	145.48	149.12	157.77	159.14	

* P - Positions

H - Yearly hires

INDICATORS

	CY	Y1	Y2	Y3	Y4	Y5	
EXCESS ENROLLMENT	1601.70	1434.29	1961.47	2503.49	3053.44	3599.42	Calculated
TEACHERS/1000 WGT. PUPILS	44.09	44.43	44.52	44.48	44.62	44.63	Calculated
SECONDARY COURSE OFFERINGS	167.00	167.00	167.00	167.00	167.00	167.00	Estimated Subjectively
INST.SPEC.,NURS.,PSYCH./1000 WGT. PUPILS	9.23	9.16	8.81	8.48	8.16	7.88	Calculated
MATLS.,SUPPS.,LIB.BKS./WGT. PUPIL	8.39	8.97	9.16	10.01	11.27	13.07	Calculated
NET EXPEND./WGT. PUPIL	863.22	888.39	903.25	921.53	945.46	969.25	Calculated
PROF. STAFF TURNOVER (PCT.)	14.00	14.00	14.00	14.00	14.00	14.00	Estimated Subjectively
PROF. STAFF MA OR MORE (PCT.)	19.00	19.00	19.00	19.00	19.00	19.00	Estimated Subjectively
PCT. GRAD. CLASS ATTEND PHSE [1]	67.10	67.10	67.10	67.10	67.10	67.10	Estimated Subjectively
DROPOUTS PCT. ENROLLMENT [1]	1.20	1.20	1.20	1.20	1.20	1.20	Estimated Subjectively
LANGUAGE ACHIEVEMENT [1,2]	1.76	1.76	1.76	1.76	1.76	1.76	Estimated Subjectively
MATHEMATICS ACHIEVEMENT [1,2]	1.35	1.35	1.35	1.35	1.35	1.35	Estimated Subjectively

SUBSIDIARY DATA

CLASSROOMS	442.00	482.00	482.00	482.00	482.00	482.00
MATLS.,SUPPS.,LIB.BKS.	118381.00	134819.44	143280.25	162847.50	190443.06	229010.25

[1] Ouput indicators

[2] Measured in this case as the mean school district score/national norm.

INDICATOR GAPS*

		CY	Y1	Y2	Y3	Y4	Y5
EXCESS ENROLLMENT	D	700.00	700.00	700.00	700.00	700.00	700.00
	A	1601.70	1434.29	1961.47	2503.49	3053.44	3599.42
	G**	-901.70	-734.29	-1261.47	-1803.49	-2353.44	-2899.42
TEACHERS/1000 WGT. PUPILS	D	50.00	50.00	50.00	50.00	50.00	50.00
	A	44.09	44.43	44.52	44.48	44.62	44.63
	G	5.91	5.57	5.48	5.52	5.38	5.37
SECONDARY COURSE OFFERINGS	D	180.00	180.00	180.00	180.00	180.00	180.00
	A	167.00	167.00	167.00	167.00	167.00	167.00
	G	13.00	13.00	13.00	13.00	13.00	13.00
INST.SPEC.,NURS.,PSYCH./1000 WGT. PUPILS	D	10.00	10.00	10.00	10.00	10.00	10.00
	A	9.23	9.16	8.81	8.48	8.16	7.88
	G	0.77	0.84	1.19	1.52	1.84	2.12
MATLS.,SUPPS.,LIB.BKS./WGT. PUPIL	D	12.00	12.00	12.00	12.00	12.00	12.00
	A	8.39	8.97	9.16	10.01	11.27	13.07
	G	3.61	3.03	2.84	1.99	0.73	-1.07
NET EXPEND./WGT. PUPIL	D	900.00	900.00	900.00	900.00	900.00	900.00
	A	863.22	888.39	903.25	921.53	945.46	969.25
	G	36.78	11.61	-3.25	-21.53	-45.46	-69.25
PROF. STAFF TURNOVER (PCT.)	D	10.00	10.00	10.00	10.00	10.00	10.00
	A	14.00	14.00	14.00	14.00	14.00	14.00
	G	-4.00	-4.00	-4.00	-4.00	-4.00	-4.00
PROF. STAFF MA OR MORE (PCT.)	D	30.00	30.00	30.00	30.00	30.00	30.00
	A	19.00	19.00	19.00	19.00	19.00	19.00
	G	11.00	11.00	11.00	11.00	11.00	11.00
PCT. GRAD. CLASS ATTEND PHSE	D	70.00	70.00	70.00	70.00	70.00	70.00
	A	67.10	67.10	67.10	67.10	67.10	67.10
	G	2.90	2.90	2.90	2.90	2.90	2.90
DROPOUTS PCT. ENROLLMENT	D	1.00	1.00	1.00	1.00	1.00	1.00
	A	1.20	1.20	1.20	1.20	1.20	1.20
	G	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
LANGUAGE ACHIEVEMENT	D	2.00	2.00	2.00	2.00	2.00	2.00
	A	1.76	1.76	1.76	1.76	1.76	1.76
	G***	0.24	0.24	0.24	0.24	0.24	0.24
MATHEMATICS ACHIEVEMENT	D	1.75	1.75	1.75	1.75	1.75	1.75
	A	1.35	1.35	1.35	1.35	1.35	1.35
	G	0.40	0.40	0.40	0.40	0.40	0.40

* This page emphasizes progress toward objectives, i.e., closing indicator gaps.

** Gaps increasing over time.

*** Gaps held constant over time.

REVENUE FORECAST

TOTAL REVENUE*

	Y1	Y2	Y3	Y4	Y5
TOTAL REAL ESTATE TAX AT CY RATE	8787052.00	9157413.00	9536634.00	9924715.00	10215377.00
NET STATE INSTRUCTIONAL SUBSIDY	3441638.00	3593057.00	3753228.00	3912856.00	4126245.00
TOTAL OTHER REVENUE	1107648.00	1223739.00	1235935.00	1263135.00	1295335.00
TOTAL REVENUE AT CY R.E. RATE	13336338.00	13974209.00	14525797.00	15100706.00	15636957.00

* This page shows expected revenues at current tax rates and subsidy factors.

REVENUE FEASIBILITY

	Y1	Y2	Y3	Y4	Y5
TOTAL REVENUE AT CY REAL ESTATE TAX	13336338.00	13974209.00	14525797.00	15100706.00	15636957.00
SURPLUS FROM PRIOR YEAR	0.0	0.0	0.0	0.0	0.0
TOTAL COST	13472749.00	14253995.00	15129159.00	16130521.00	17155952.00
SURPLUS(+),DEFICIT(-) AT CY TAX RATE	-136411.00	-279786.00	-603362.00	-1029815.00	-1518995.00

	CY	Y1	Y2	Y3	Y4	Y5
REAL ESTATE TAX RATE (MILLS)	89.50	90.85	92.16	95.02	98.56	102.50
YEAR TO YEAR CHANGE *		1.35	1.31	2.86	3.55	3.94

	Y1	Y2	Y3	Y4	Y5
TOTAL REVENUE AT Y1-Y5 R.E. TAX RATES	13472748.00	14253994.00	15129157.00	16130[illegible]0.00	17155936.00
SURPLUS FROM PRIOR YEAR	0.0	0.0	0.0	0.0	0.0
TOTAL COST	13472749.00	14253995.00	15129159.00	16130521.00	17155952.00
SURPLUS AT Y1-Y5 R.E. TAX RATES	0.0	0.0	0.0	0.0	0.0

SUBSIDIARY DATA

		Y1	Y2	Y3	Y4	Y5
REVENUE/MILL		102199.87	106299.87	110499.87	114799.87	117959.94
COLLECT PERCENTAGE	99.00					
COLLECTED REVENUE/MILL		101177.81	105236.81	109394.81	113651.81	116819.87

* Year to year change in tax rate to remove deficit. Financial feasibility can be judged by whether or not the tax rate will be accepted by the community.

different availabilities of manpower, or different revenue bases. Various assumptions about future cost factors, such as inflation rates can also be used. It is also possible to carry out the planning over a longer planning horizon. Ten-year forecasts have been made for some school districts in the study.

Policy

In the context of the base case output the decision-makers must examine existing objectives, make appropriate modifications, and establish new objectives where necessary. The new set of objectives constitutes a statement of policy. In particular, the decision-makers must establish objectives in terms of indicator gaps. This requires the following:

1. They must review the indicators they are using to determine whether they want to add or delete indicators. Not every aspect of the school district can be represented by indicators, but certainly the most important ones should be included.
2. The decision-makers then must establish the desired levels which they wish to attain for each indicator by the end of the five-year planning period. This means that the decision-makers must translate community goals into specific five-year objectives.
3. The decision-makers must establish priorities between the various indicator gaps. Is it more important to

improve reading achievement or is it more important to reduce the teacher turnover rate? Some ranking of the indicator gaps is required in order to complete the planning process.

At this time the decision-makers must also establish some constraints on the planning process. They might restrict the level of possible tax increases because of the local political situation. They might set practical hiring limits because of the presumed availability of manpower as the result of supply and demand factors or limited recruiting resources. They may also point our new legal constraints, such as a directive to accelerate the integration of the staff and the pupils. Of course, there are also physical constraints that must be specified, such as the fact that buildings cannot be occupied before they are built, and so on. Accordingly, planning to achieve a given set of objectives takes place within certain specified constraints.

Project Design

The next step in the EPPB System is to design projects-modifications to the way the school district presently operates -- which will help the school district attain its objectives. Generally, one or more project teams are assigned the task of designing a project to attain a particular objective. It is recognized, however, that when the team has completed the design

of the project several indicators will probably be influenced. The project design effort should be carried out using "systems analysis" techniques.

Clarification of the confusion concerning the use of systems analysis techniques in the planning-programming-budgeting is in order at this point. Systems analysis is a method for solving problems. The systems analysis approach was used in designing the overall EPPB System. This approach is also recommended for use in designing projects.

The steps employed in designing projects are as follows:

1. The objective for the project is defined in terms of the indicator gap and its priority rating both at the school district and organizational unit level.
2. Alternative methods of attaining the objective are examined. These alternatives will be suggested because of research or the experiences of others.
3. Several possible projects may be designed that are based on the alternatives. Each project is defined by indicating the techniques to be used, manpower required, space needed, salaries and other costs, and, where applicable, instructional hours per pupil. Preliminary estimates of total cost and resource usage are made for each project. Estimates are also made concerning the degree to which each project will attain the objective.

4. If one project is clearly the "best", it is selected. However, if several projects appear to be equally preferable, then each is retained for consideration in the planning process. The selection among these projects will be made during this process.
5. An implementation plan is prepared which involves detailing the tasks required to implement the project, viz., sequence and cost implications.
6. The specific data is prepared for computer input for all the projects that are to be proposed. (See print-out page 25 for typical display of project data and information.)

Planning

The next step in the EPPB System is to select that set of projects which will do the most for the school district within the specified constraints. To do this the planner selects a number of project sets or combination of projects which he wishes to examine. A set might include a school addition, new remedial reading project, instructional materials center, and improved counselling service. The EPPB System then estimates the indicator changes for each project set and computes the required added revenues in terms of dollars and increased tax rates. Figure I-G graphically displays output from the System. The decision-maker must then make a choice between the project sets,

OPERATIONS PROJECT ALTERNATIVE NUMBER 1 READING IMPROVEMENT

CHANGE IN PROGRAM-ELEMENTARY INSTRUCTION

MANPOWER	Y1	Y2	Y3	Y4	Y5
TEACHERS - ELEMENTARY	1.00	1.00	1.00	1.00	1.00

COSTS	Y1	Y2	Y3	Y4	Y5
SALARY	10000.00	10700.00	11448.98	12250.40	13107.92
NON-SALARY	0.0	0.0	0.0	0.0	0.0
CAPITAL OUTLAY	0.0	0.0	0.0	0.0	0.0
TOTAL ABOVE	10000.00	10700.00	11448.98	12250.40	13107.92

CHANGE IN PROGRAM-INSTRUCTIONAL SUPPORT SER.

MANPOWER	Y1	Y2	Y3	Y4	Y5
PRINCIPALS	0.0	0.0	0.0	0.0	0.0
INSTRUCTIONAL SPECIALISTS	3.00	3.00	3.00	3.00	3.00
CLERICAL PERSONNEL	0.0	0.0	0.0	0.0	0.0

COSTS	Y1	Y2	Y3	Y4	Y5
SALARY	18000.00	19259.99	20608.16	22050.73	23594.25
NON-SALARY	0.0	0.0	0.0	0.0	0.0
MATLS.,SUPPS.,LIB.BKS.	3000.00	3090.00	3083.00	3278.00	3376.00
CAPITAL OUTLAY	12000.00	0.0	0.0	0.0	0.0
TOTAL ABOVE	33000.00	22349.99	23691.16	25328.73	26970.25

INDICATOR CHANGES

	Y1	Y2	Y3	Y4	Y5
SECONDARY COURSE OFFERINGS	0.0	0.0	0.0	0.0	0.0
PROF. STAFF TURNOVER (PCT.)	0.0	0.0	0.0	0.0	0.0
PROF. STAFF MA OR MORE (PCT.)	0.50	0.50	0.50	0.50	0.50
PCT. GRAD. CLASS ATTEND PHSE	0.0	0.0	0.0	0.0	0.0
DROPOUTS PCT. ENROLLMENT	0.0	0.0	0.0	0.0	0.0
LANGUAGE ACHIEVEMENT	0.16	0.16	0.16	0.16	0.16
MATHEMATICS ACHIEVEMENT	0.12	0.12	0.12	0.12	0.12

i.e., balancing the added costs against the gains indicated by changes in indicator levels.

Typically, project sets fall into the pattern shown in Figure I-G. It is assumed that some overall priority weighting of the indicators can be used as an overall measure of the relative "goodness" of a plan, although this is not necessary. Some project sets produce higher benefits and cost more. The project sets which produce the most benefit within a given cost range are the only ones considered. These are the ones that lie along the line called the efficient frontier. The choice among these efficient sets is a judgment of the planner and decision-makers. The most suitable set and, hence, the one chosen, occupies the most favorable position on the efficient frontier and does not exceed the constraint of "maximum feasible tax rate increase".

Establishing the Annual Budget

After a group of preferred projects has been selected for implementation, the entire results of the planning process must be translated into an operating budget for the next year. There are three general methods of doing this -- Figure I-H illustrates these methods. In Method 1, the planning data is used intuitively by the budget makers to produce the next year's budget. This budget is then recrosswalked into the program categories. The result of this budget crosswalk and the plan are

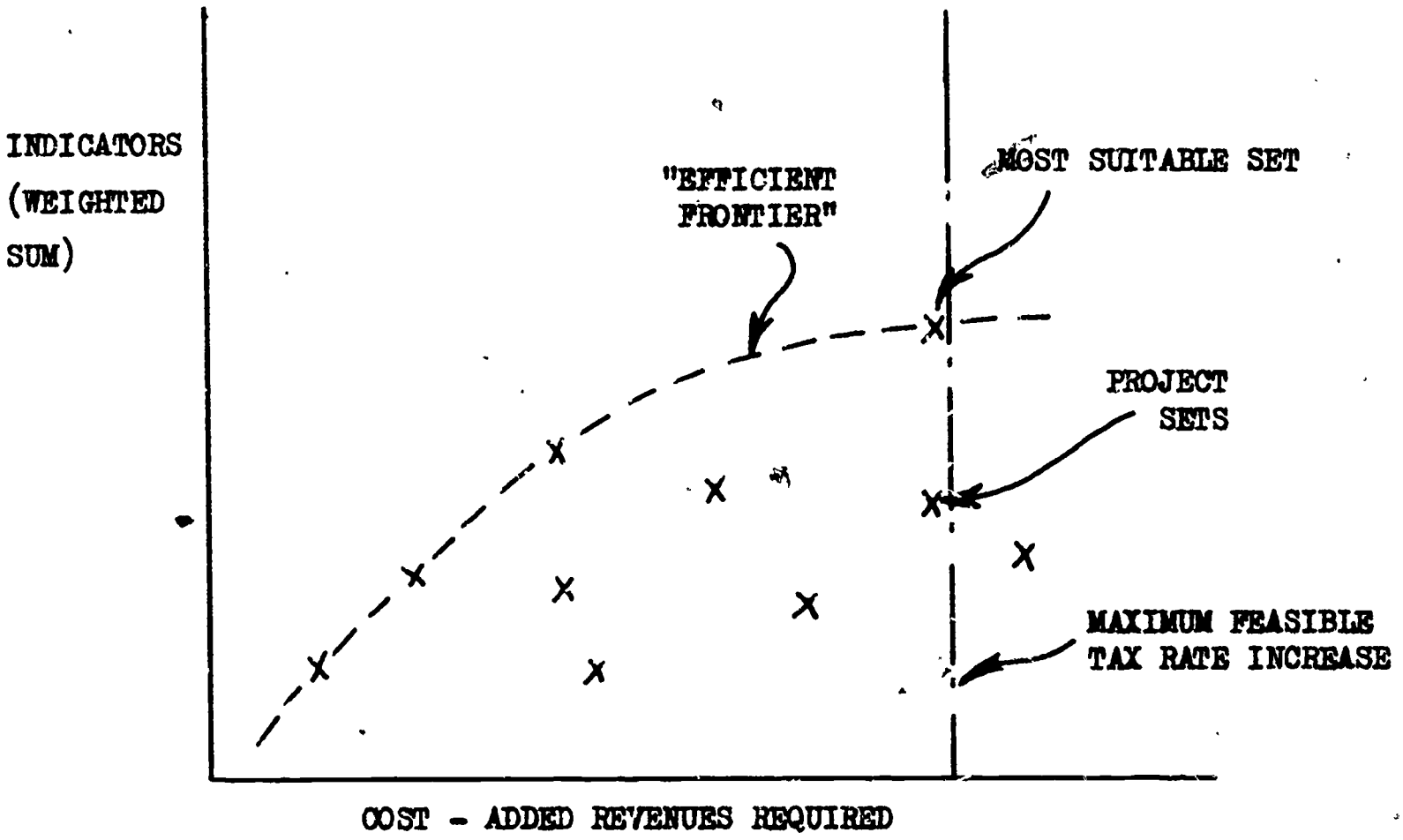
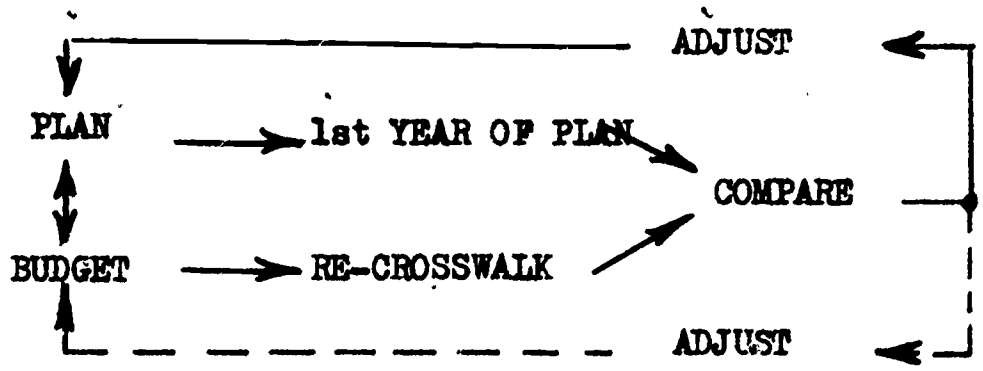
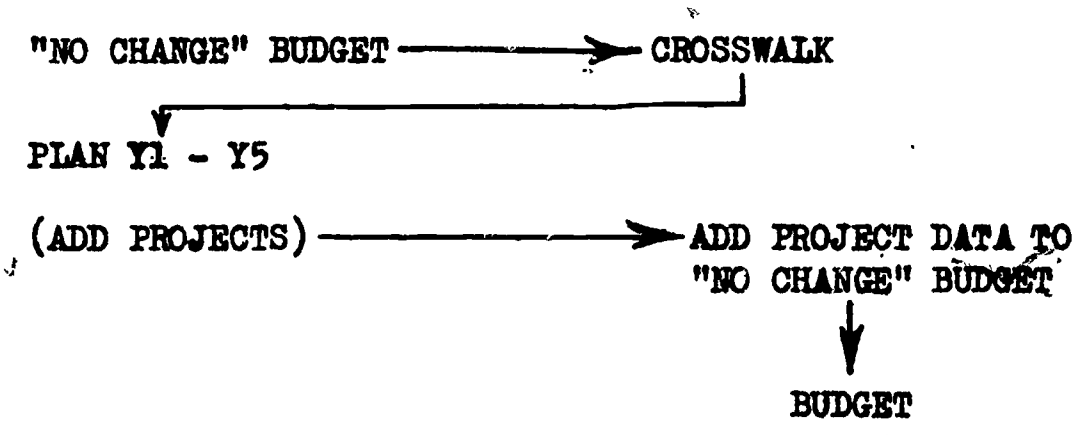


Fig. 1-g. **A display of typical planning results.**

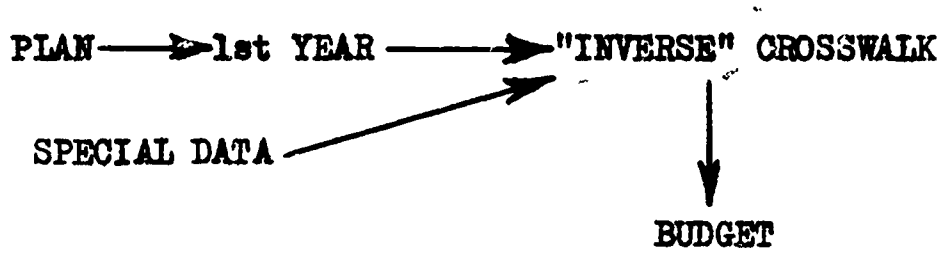
METHOD 1 - PARALLEL DEVELOPMENT



METHOD 2 - EPPBS METHOD



METHOD 3 - DIRECT



METHOD 3 REQUIRES DATA NOT CARRIED IN THE EPPB SYSTEM - ACCOUNT DATA WITHIN PROGRAMS AND PROJECTS.

Fig. 1-h. Methods for establishing the annual budget.

compared. There may be differences since the budget preparation may have misinterpreted some of the planning implications. Adjustments are made to either the plan or the budget until the plan and budget are in agreement. The budget is then prepared. This method was first used with the EPPB System.

Method 2, the one now recommended for use with the EPPBS, depends upon the assumption that new projects can be planned at the level of detail of expenditure accounts. The procedure is to first prepare a year-one budget under the assumption that no new decisions are made, that is, a no-change or continuation budget. The no-change budget is then crosswalked to estimate year one's costs. Planning then proceeds as usual -- producing the new projects which are described at a detailed cost level. The project data for year one can then be added to the no-change budget to obtain the total year one budget.

It is possible with Method 3 to convert directly from a plan to a budget. However, this method requires some special data which is not handled by the EPPB System. In order to accomplish this process it would be necessary to carry the expenditure account data within each program and project category and within each budget category. If this is done, then the translation from the plan to the budget can be made directly. Since the data system required is complex, it will be some time before school districts can implement such a data system for the purpose of utilizing this method.

Summary

The main benefit of the EPPB System is that it provides a school district with a clearcut way of establishing budgets which: (1) relate activities directly to district objectives and, presumably, community goals and (2) ensure that projects undertaken in any year are a logical part of a long-range, comprehensive plan directed toward further improvement in the educational process. The System is completely defined by a series of manuals. All necessary forms, procedures and computer programs are available. A training program has been developed to assist in acquainting potential users of the System with its elements and procedures.

In developing the Planning System for the New Jersey Division of Vocational Education we have not been bound by the framework of the EPPBS. Obviously there are significant differences in the management problems facing a major state agency that both operates and funds programs, and a school district. The increase in complexity over the school district system has been enormous. Thus, the chapter that follows discusses the vocational educational setting and, within that context, the need for an integrated comprehensive planning system.

Chapter II

THE SETTING - NEW JERSEY DIVISION OF VOCATIONAL EDUCATION

Vocational Education in the Nation

Vocational education is one of this nation's most neglected educational missions. Until recent years, moreover, attention to that mission was entirely sporadic, uncertain, and generally unrelated to regional economic problems and individual aspirations. Since the passage of the Vocational Education Act of 1963, and the Amendments of 1968, vocational and occupational training has been recognized as a matter of national concern. Yet the emphasis and resource priority given to vocational education, as compared - for instance - with that of higher education, still raises value questions about the basis for assessing our national educational requirements. Whatever measure of educational need is employed - demand from potential students, return on societal investment, or manpower requirements in the public and private sector - the benefits from allocating resources to vocational education can be convincingly demonstrated.

Yet, though Federal funds have been available for vocational education since 1917, non-professional education had been supplementary, confined to a limited range of programs, and

directed at limited economic benefits. Only in recent years has this concern been expanded to embrace the potential personal aspirations - adult literacy, citizenship training, enrichment and self improvement - and need for occupational training among an increasingly significant proportion of our total national and urban population.

Much of this lag in recognizing vocational educational needs stems from the difference in the student selection process. At the elementary and secondary levels the American system of education recognizes an absolute obligation to accept all children regardless of condition and circumstances. In higher education our very survival as a nation continues to be viewed as inextricably linked to accepting all secondary students whose prior educational attainments indicate the capacity to benefit from further studies. This demand for higher education is further fortified by the ability and/or willingness of substantial segments of our population to bear the economic burden of college education for their children.

By comparison with basic and higher education, the demand or need for vocational and technical education is far more amorphous. Demands for basic and university education are presented in unequivocal terms by a segment of our population capable of pressing its demands on public officials; the need is manifested in specific terms and does not require extensive governmental effort to determine it, though forecasting of future demand is required. In contrast, vocational education requires

government in effect to recruit its clients; it is neither compulsory or predictable from what has occurred in the past. An effort must be made both to measure the existing interests of people in further occupational education and to provide those lacking work objectives with guidance on emerging manpower requirements in the total economy. Vocational education, at the state level in particular, therefore requires a combination of educational and human resource planning. Thus management of vocational education presents a further dimension of complexity beyond the admittedly difficult problems of basic and higher education.

Pressures on the management of vocational education are further compounded by the absence of an integrated national manpower policy that provides systematic information to unemployed and under-employed persons, leading to retraining and even relocation. Below the national level, however, it is transparently obvious that states and communities would rather import employers than export active members of the labor force. Thus, moving beyond the human dimensions and aspirations of an increasingly large segment of our population (much of it located in urban areas), we can recognize the essentially competitive economic ingredient in state vocational education programs.

To summarize, vocational education as a field in American public education has unique management problems, both in arriving at objectives and overcoming some crucial restraints on programs:

1. The selection-in process or demand for vocational education - and those adults who influence it - is far more amorphous than that for basic and higher education;
2. Vocational educational agencies, under existing Federal law, have an obligation to discern <u>both</u> existing interests and demand for occupational training and to attempt to modify that "demand" based on some perceived understanding of the manpower requirements of the regional or state economy;
3. Vocational educational agencies bear much of what appears to be a popular dissatisfaction resulting from the lack of an integrated national manpower policy;
4. As various "emergency" training efforts directed toward disadvantaged segments of our urban population proliferate, State vocational education agencies will face major management problems in coordination and in effective allocation of funds;
5. State vocational educational programs must, in conjunction with local educational agencies, serve the needs of its citizens while contributing to maintenance of the economic viability and growth of that state in competition with other states.

These factors constitute some of the major management dilemmas facing the vocational education program of the State of New Jersey.

Vocational Education in the State of New Jersey

The Economic Context

That New Jersey is a highly industrialized state requires no documentation. As such the prosperity and economic well being of the State turns in part on its ability (1) to offer existing industries a source of competent manpower and (2) to attract new industries by the presence of manpower possessing particular occupational orientations and skills. One obvious economic goal is prevention of industrial exodus and the concomitant attraction of corporate facilities. Attaining a favorable domestic balance of industrial presence requires both superior vocational training and perceptive anticipation of major technological shifts within the economy at large.

The vital economic ingredient in vocational education programs can be equally well stated from the viewpoint of the individual. For the many individual citizens of New Jersey that concern is unemployment. To quote a publication of the Division of Vocational Education entitled "New Windows on Learning" -

> Massive unemployment in the midst
> of burgeoning economic opportunities
> is the gloomy prediction... Many jobs

> are going to people brought at great expense from elsewhere - while our own people are often adding their names to the welfare roles.

Economists give a specific name to this type of unemployment, and that is "structural unemployment". It is no exaggeration to claim that treating structural unemployment will represent the major domestic economic issue of the seventies; lessening such unemployment may well be the prime goal of vocational education.

As opposed to cyclical or periodic unemployment, which results from drops in demand and thus spending, structural unemployment stems from an inflexible supply of productive resources, particularly manpower. This leads to precisely the condition which the New Jersey Master Plan committees have anticipated, that is, <u>significant unemployment occurring simultaneously with and geographically coincident to substantial labor shortages</u>. Expressed simply, the question is how can the times be good, and labor conditions so bad. Cyclical is the demand, structural the supply side of the unemployment equation. Cyclical unemployment has traditionally been a Federal government concern; the degree of structural unemployment can be seen, however, as requiring a response by state and local training agencies. As Wilbur R. Thompson's "A Preface to Urban Economics" (Baltimore, Maryland: The John Hopkins Press, 1965) states at p. 207,

> The treatment of structural unemployment clearly requires a reconversion of the labor supply through retraining and relocation programs to fit changing patterns of occupational, industrial, and spatial demand.

The prime concern of vocational programs is with the supply side. Balancing individual vocational interests with the employment options of resident employers is best accomplished at the state-local level. The last assertion, however, is more than truism. The complicated, and frequently strained, relationship between the unemployed and labor-short employer requires a comprehending, locally-aware influence to mediate. A totally integrated state-wide vocational educational program is one of the most probable mediating influences. An essential component of such a program is adult literacy training, which makes other training possible. Without such a program, unemployment may co-exist quite easily with unfilled jobs.

Concern with this economic goal of vocational education, i.e., the need to offer the private sector a continuing and flexible source of competent manpower, is suggested by reports and interviews within the Division. The Curriculum and Programs Subcommittee of the Master Plan Study groups begins its report by citing the "urgent need for expanded vocational and technical education programs to provide occupational training for both

youth and adults in order to meet the demands of modern industry and business...". Perhaps the single best economic indicator, suggested by the Assistant Commissioner, is actual positions filled, though obtaining the necessary information through follow-up studies may be an expensive evaluation procedure.

There are two important consequences for the Planning System in stressing the economic objectives of a vocational education effort: (1) specific indicators must be formulated in terms of economic objectives and data must be obtained (a) in order to establish the current level of these indicators and (b) to permit estimates of a future level assuming no change in policies; (2) a considerable expenditure of resources may be involved in making or acquiring input forecasts, projections, estimates, or predictions concerning the economy of New Jersey.

Despite the emphasis placed on the legitimate economic objectives of a state vocational technical program, this by no means implies that the Division is preoccupied solely with the economic or manpower aspects of vocational education. Concern with the human and social needs to be served is abundantly present in those activities of the Division which are specifically concerned with personal enrichment and citizenship training.

Emphasis on the individual and the objective of vocational programs in assisting people to achieve higher levels of vocational attainment is also clearly revealed in the Statement prepared by the Philosophy and Objectives Study Area Committee.

The Subcommittee characterizes vocational education as "that part of the total educational program which helps individuals to define and work toward occupational objectives".

While it is self evident that a State such as New Jersey, with specific economic goals and aspirations, must be mindful of the economic-manpower considerations in vocational education planning, the Division is aware of a far broader range of responsibilities and, in the context of this planning system, of possible objectives derived from these responsibilities. Questions related to this point will be examined further in our discussion of forecasts in Chapter III.

Evaluation of the Division and the Planning Function

The present Assistant Commissioner of the Division of Vocational Education entered the post at precisely the time when vocational efforts in the nation were taking an entirely new, and better funded direction. In January, 1965 when the present Assistant Commissioner assumed direction of the Division, the impact of the Vocational Education Act of 1963 was just being felt on state administration of vocational programs. Shifting emphases brought new complexity to the management of the Division. From the limited program orientation under the Smith-Hughes and George-Barden Acts was emerging new concern with construction of facilities, research, and program evaluation and administration. Beginning in 1965 a greatly expanded and far more integrated response was contemplated, with emphasis on

expanding enrollments, faciliites, and teachers. New construction was facilitated by a 1967 New Jersey Act providing for area vocational-technical schools.

With passage of the Vocational Education Amendments of 1968 (Public Law 90-576) further resources and a firmer mandate for performance fell to the states. However the problems of management, and particularly coordination, had become exponentially more complex from 1963-1968 with the proliferation of Federal, local, and private efforts at vocational training. Thus the 1968 amendments required a review of possible duplication, and - almost assuming that some was inevitable - reports on the extent of such duplication. While we may regard a certain amount of waste as inevitable in a democracy, the obligation of those managing state vocational education programs was and is to filter out the maximum amount of duplication.

In this era of rising interest in vocational education and its expanded program and management responsibilities, the necessity of viewing developments over a longer period has led to several planning efforts in New Jersey. The most extensive of these was the work of the Study Area Committees for a Master Plan of Vocational Education in New Jersey through 1980. Viewing the vocational education program from the perspectives of philosophy and objectives, research and evaluation, curriculum and programs, facilities, finance, guidance and personnel services, teacher needs and preparation, organization-administration-leadership, and public information, these committees produced a body of

material highly relevant to building the elements and ingredients of the planning system contemplated by this report. As may be inevitable with sub-committees formed to study a particular subject, implementing the totality of recommendations would have required an enormous expenditure of resources. Thus a Plan for Action summarizing and selecting among these recommendations was prepared by the Division staff. In the development of the full Planning System the Division could use to advantage the ample factual and philosophical discussions contained in this excellent series of reports.

In sum, within a short period of five years the Division of Vocational Education has been confronted with a virtual revolution in purposes and considerable growth in the resources to achieve those purposes. During this period the policy-making personnel in the Division have been pressed simply to administer the emerging revenue sources in such a manner as to meet Federal requirements and keep the dollar flow between Federal-state-local educational agencies moving.

The following section is an attempt to characterize the decision-making processes, information systems, and financial management systems as they presently exist in the Division. Considering the divergency among the bureaus within the Division and among the programs administered by these bureaus, general statements on organizational and management dimensions are always tenuous. Yet these notions are central to the discussion of the perceived need for a planning system which conclude this chapter,

and to the general design considerations which are explained in Chapter III.

General Examination of Existing Decision-Making Processes, Information Systems, and Financial Management Systems

Since early September, 1969 the operations and activities of the Division and the entire vocational program have been reviewed. Interviews have been conducted with Division staff, focusing on application processes and funding decisions. In addition, (1) statements of Division policies and procedures, (2) reports of the Committees on the Master Plan for Vocational Education, (3) the three-part state plan for P. L. 90-576, (4) the comprehensive list of forms used within the Department, (5) relevant cooperative agreements between the Division and a variety of public and private agencies, (6) all federal statutes under which the Division operates, and (7) pertinent financial and budgetary documents have been reviewed. As an example, considerable attention was given to the application process now being employed for P. L. 90-576 and an illustrative computer aid was designed to assist in this review and selection process.

Our fundamental purpose has been to understand the decisions made within the Division, without assuming that these decisions could be accommodated within the EPPB System or that they required some pre-determined computer hardware. Nor were decisions treated abstractly in an attempt to identify the full

range of forces bearing on the official making the decision. Our focus has been on resource allocation decisions and the dimensions over which such decisions are made. Resource decisions were examined in each of the bureaus to assure that the generalized planning system incorporated, aS nearly as possible, all the relevant components of each bureau's practices.

Decision-Making Processes. This description of Division decision-making relates solely to issues of programs and the funding of programs; decisions on other matters such as administrative procedures and the content of these decisions have not been considered. Decision-making in the Division may be characterized as (1) revenue source specific, (2) diffused through several levels of the organization - including the Assistant Commissioner, bureaus, offices, and program units and (3) reactive to application processes and local educational agencies.

Decision-making within the Division of Vocational Education is first revenue source specific, that is, decisions are largely made in the context of a particular revenue source. The funding is quite complex, which reinforces this tendency to make deicisons in the context of single revenue sources. In the body of our recommended planning system we have identified six continuing Federal sources which provide funds for the Division: (1) Vocational Education Amendments of 1968 (Act 90-576), (2) Civil Defense Education Act of 1950, (3) Manpower and Development and Training Act Amendments of 1969, (4) Social Security Act

Amendments of 1967 (WIN), (5) Adult Basic Education Amendments of 1966, Act 89-750, and (6) Veterans Administration. On the State side are the Division budget and a variety of grants-in-aid. In addition there are a small group of non-continuing Federal sources, such as the Economic Development Act which fund special projects run by the Division. These are discussed in considerable detail in the explanation of the General Design of the planning system.

Generically we can identify four types of revenue allocation and project selection decisions: (1) allocation of Federal funds and State categorical grants to specific local educational agencies; (2) allocation of Federal funds to state agency operations; (3) allocation of funds to State operations; and (4) allocation of non-categorical State grants-in-aid across LEA and State programs and projects.

The point being made here is simply that decisions concerning the allocation of resources to local educational agencies, state-operated facilities, construction projects, and other program delivery agencies are now being considered one source at a time. As a result the conclusion of our analysis was that the individual revenue source was the unit around which planning should take place.

In the process of our analysis several alternative units were examined; (1) the bureaus and other organizational separations within the Division, (2) traditional programs such as health occupations, distributive education, and industrial arts,

(3) geographic or areal divisions of the State, and (4) even clients served. But in view of the prevalence of application and grant processes and the highly varied time periods over which the administration of vocational grants occurs, creating a system of Division-wide planning seemed possible only by using each single revenue source as a unit of analysis. And only by understanding planning for the individual revenue sources could the higher level planning system for the Division be developed.

The second characteristic - the relatively diffused nature of the decision-making - is in part a result of the diverse responsibilities in deciding on instruction and construction projects. Where an associate state director or bureau head has the sole responsibility for a single revenue source, decision-making is less diffused. However, several directors or bureau operations are commonly involved in resource allocation decisions, thus creating a further reason for a higher level planning system.

The Division's application process for P. L. 90-576 - including the flow diagram of the application evaluation process, the criteria for evaluating project proposal, the guidelines for such applications, and factors entering the final selection decision - provides a good example. In reaching a decision on projects to be funded, both the merit of the application and the merit of the local educational agency, (the last in terms of such factors as drop-out rates and unemployment) were considered. Moreover the consideration of the applications, though under

Ancillary Services, required participation from program personnel in several bureaus.

The Assistant Commissioner of Vocational Education exercises control over the policies of each of the major branches and individual bureaus of the Division. But, in part because of the diffused nature of decision-making, this control does not emanate from previously established and enunciated Division-wide policy; the control seems to stem from immediate preferences for certain activities of that bureau or program unit for the next fiscal year.

A final, and somewhat more limited, characteristic of the Division's decision-making on resource applications is the tendency to be reactive to application processes and to the requests of local educational agencies and other grant seekers. No matter how careful the screening process in making grants, the combination of programs and projects ultimately funded may not be meeting the needs of the State of New Jersey as defined by the Division of Vocational Education. This is not to suggest that the totally centralized approach, whereby some states simply decide the dimensions of the programs and fund without benefit of local applications, is desirable. The point is that if a state, as part of its planning process and through its policy-making boards does establish certain objectives (and priorities among these objectives), achieving those objectives becomes the paramount goal of operating officials; if these objectives cannot be met by some manipulation of the funding requests that are

forwarded to the Division, then the state agency should have the option of promoting and soliciting additional instructional and construction projects to accomplish the objectives. Such an option is built into the planning system as formulated.

Information Systems. Inadequacies in the information system, according to Division officials, constitute a major weakness in its administration. The information system of the Division fundamentally serves to meet formal and informal reporting requirements of Federal, state, and private sources of funds, and to permit evaluations of the effect of vocational education programs. With the increase in the number of revenue sources both reporting and evaluative requirements have vastly expanded.

Before describing some of the flaws in the existing information system it is important to emphasize the close relationship between information and program evaluation systems. Total evaluation of state vocational education programs requires an information system that supplies data about program results, a continuing determination as to whether the information system is contributing data useful for evaluation, and the presentation of data required in a format that assists in the evaluation. The description of the "Vocational Education Information System" prepared by the Federal Electric Corporation concludes that with such a system "current nationwide quantitative and qualitative analysis can be made and the results used to revise and expand training programs...". Information systems must provide all the

data needed for evaluation; yet if information is being produced that is not used in the Division's evaluation or in the review and evaluaiton decisions of other agencies to which data is reported, then some revision is necessary. Information and ev[illegible]tion systems are inseparable.

Division officials characterized the present data gathering process and instruments as rigid and requiring overhaul, particularly in eliminating requests for data that was not used in Division decision-making. Other criticisms included the following: (1) informal requests for information from other levels of government that required collection and aggregation of data in a manner different from the formal reporting requirements were extremely difficult to meet; (2) the system is solely oriented to reporting program dimensions and not to producing information on which forecasts of future conditions and program parameters could be based; (3) maintenance of the reporting system as representing by existing forms requires an extraordinary effort; and (4) in general, the expenditure of energy required to locate, aggregate, and organize information is so extensive for all the above purposes that it discourages key evaluation questions from being raised.

Division officials also recognized a distinction between information which passes from local educational agencies and other units to Federal or foundation sources of funds, and that information which the Division employs for evaluation, control, and as a basis for related management decisions. A data

collection system to meet both requirements is recommended by the Division's officials in the Plan for Action; the Plan proposes that improvement "...be achieved by (1) conversion to automatic data processing and (2) the establishment and development of a planning, programming, and budgeting system." This discussion recognizes that an information system can only appropriately be developed in conjunction with a total planning system and not on the basis of gathering data for some vague notion of what may conceivably be relevant to all possible future decisions.

With this background, certain preliminary judgments can be made on the extent to which the Division's information system provides data for decision-making; in the context of the Planning System presented in Chapter I these decisions should include development of forecasts and program evaluation as to whether key objectives expressed by indicators are being achieved. Problems exist in the current information system on both these dimensions and include the following:

-there are real computational difficulties in utilizing the information now available from a variety of reporting and application requirements. The format in which much of this information is available does not facilitate analysis or understanding and requires manipulation and representation. Again, the "Illustrative Computer Aid to Vocational Education Application Review and Selection Procedure" is an example of a tool to overcome some computational questions in the P.L. 90-576 application process; however this

difficulty is by no means confined to this single revenue source.

-the Bureaus within the Division currently acquire much information which is not uniform and/or compatible across revenue sources; to move toward a comprehensive integrated Division planning system will require definite change in this situation.

-at present there is only a loose connection between the Division's management objectives for each revenue source and the information gathered on program performance.

-the existing information system for almost all present revenue sources permits only sequential attention as opposed to simultaneous consideration of constraints and objectives.

-there is a lack of information concerning the impact of vocational programs on local educational agencies staff and space needs, again with no total view cutting across sources.

The present information system, in summary, is adequate to meet the formal Federal reporting requirements but has deficiencies in responding to significant informal requests and, most critically, in providing the basis for an evaluation system for state vocational education.

Financial Management. Financial management is treated in an extremely narrow sense in this discussion. The concern is with the structure of the financial decisions and how these decisions relate to planning, not with traditional financial control

functions. Inter and intra governmental fiscal transfers and the latitudes left for Division decisions are the center of attention, not the requirements of financial reporting and record keeping. Thus the Planning System presently contemplates no changes in any aspect of financial management and control practices, with the present timing of planning for existing revenue sources being accepted as given in the discussion of the Planning System in Chapters III and IV.

In this limited context certain statements concerning Division financial management can be made. First, the Division is involved with management of a considerable number of continuing and non-continuing sources of funds (several have been mentioned above, all sources are presented in Chapter III); second, the degree of control exercised over the use of funds varies considerably according to the basic law of each funding source; and third, where the Division administers the law, as with P.L. 90-576, it decides the content of the program, but there are numerous instances where the basic decisions about clients and areas to be served are made by other governmental agencies, though the subsequent management and operations are handled by the Division. The crucial question for each revenue source, then, is the extent to which the Division controls the content of decisions concerning the use of funds for various revenue sources.

As noted above, the control over financial transfers to local educational agencies is virtually complete in the

Vocational Education Act. But there are a variety of other arrangements. Manpower Development Training Act (MDTA) and Work Incentive Program (WIN) funding decisions are made principally in the New Jersey State Departments of Labor and Industry and Welfare. While the Division of Vocational Education maintains the record of grants and supervises the operation of programs funded from these sources, decisions about which New Jersey counties will be served, which manpower programs will be supported, and related matters are decided by the other State agencies. Another instance is the categorical grants made through Adult and Continuing Education which are on a reimbursement basis, where the reimbursement or state grant is automatic with no decision options; programs run on this basis include adult literacy, foreign born residency, and supervisory costs for adult vocational technical education.

Certain additional tendencies do exist in the financial management of the Division which require brief mention. Foremost is the tendency to separate the planning of the Division budget and grants-in-aid from the planning of the activities connected with Federal revenue sources. And given the uncertainties associated with both Federal and State revenues, there is also the inevitable result that planning of expenditures must take place without knowledge of the funding situation.

Basically the financial management system, with its numerous Federal reporting and financial requirements, acts as a clear constraint on the Planning System in two regards: (1) as noted

above, the timing of the planning for each revenue source is dictated by the vagaries of financing, and (2) financial and program responsibilities around a particular revenue source are often split between the Division and other Federal or state agencies, making forecasts and other aspects of planning problematic. In developing the Planning System for the Division these constraints have been accepted, though some modification in administrative practices might be considered in its implementation.

The Need for Developing and Implementing a Vocational Educational Planning System

Before undertaking the development of a comprehensive planning system for any public or private activity it is entirely legitimate to ask - is there a need and does that need merit the investment required? In a governmental program like vocational education there is an entirely natural tendency to channel new financial resources directly into programs for the immediate benefit of the considerable range of potential clients. But the crucial question remains, what will be achieved by these programs, and why is planning required? The answer has both an external and internal response, the first a matter of the place of State vocational training efforts among other manpower training efforts, and the second whether that program or programs

is contributing to the achievement of objectives established by the Division.

External Factors bearing on the Need. A national shift in priority given to vocational and occupational training has occurred during the 1960's. Emphasis on the disadvantaged as clients and on the urban areas as having unmet vocational needs has introduced a critical management dimension. The economic and emotional overtones of the service have brought a web of often conflicting efforts from Federal agencies, business and corporate activity, unions, non-governmental anti-poverty efforts, and state-sponsored or financed vocational training. Duplication, overlapping, and unproductive expenditures are clearly a concern, but at this level eliminating such waste of resources becomes exceedingly complex, involving both intergovernmental and public-private questions.

Yet there is a requirement for comprehensive manpower services, and for overall direction of an unwieldy aggregation of programs. Such efforts as CAMPS - the Cooperative Area Manpower Training System - can help to bring some order out of this confusion. But a fully operational planning system for state vocational education could also have a highly beneficial tendency toward program coordination. The pressure for vocational education is sufficiently great that it would be foolish to argue that a unified thrust should be achieved at the cost of eliminating programs of training, from whatever source. No one argues, moreover, that the range of programs provided by the New

Jersey Division of Vocational Education, despite increased and increasing resources, could accommodate the total demand for vocational education even recognizing that the demand is not unilateral and can be influenced by governmental policy.

How then could the state plan serve to facilitate intergovernmental and interagency vocational planning, thus getting at duplication of effort? By making operational a planning system, the Division of Vocational Education can readily identify those objectives which it expects to achieve over a given period of time; the Division can also indicate other objectives which it believes to be legitimate but has not been able to fund because of revenue, personnel, space or other constraints. There is no requirement that other Federal or private agencies would have to accept the objectives and priorities formulated by the Division, but only that they recognize the commitment of the State to achieve certain specified objectives. These agencies would not then undertake training in the same occupational field unless (1) the State objective was for various reasons understated or (2) interim reviews suggested that the State would not achieve the objective within the present allocation of resources and could not commit anything further to the project.

Let us use the health occupations as an example. Assume that the Assistant Commissioner and The State Board of Education have agreed that the primary objective for the coming two years is to produce a defined number of paramedical and health

personnel and have them available for employment in March-July, 1972. (The objective would have been derived from an occupational requirements forecast predicting such shortages as to cause a high priority rating for this effort.) The staff of the Division would examine all revenue sources in their annual planning cycle to determine which could contribute to filling the objective of say, 1350 health occupations personnel in various skill categories. Since health occupations and paramedical personnel would be given top priority we can assume that the Division would have sufficient funding resources. For the sake of the example let us also assume that the Division would receive sufficient applications for funding that were designed to train personnel in the health occupations field. (Under the recommended Planning System if there were insufficient applications, the Division would promote them.)

With the applications funded, the Division could disseminate its New Jersey State Plan, indicating, that among other objectives, the training of the 1350 health personnel would be accomplished prior to July, 1972. When made available to other agencies contemplating occupational and manpower training, they would have a basis for investing in a training effort not contemplated by the Division's Plan unless such agencies had a rationale for feeling that (1) the 1350 underestimated the actual need for health professions personnel, (2) the programs funded would not produce the necessary personnel, or (3) the demand among the potential clients for health training was so great as

to merit providing the education despite potential placement problems.

Thus a comprehensive, integrated State planning system for vocational education is necessary in order to coordinate state-administered vocational education efforts with other continuing, non-continuing, and emergency vocational education programs such as the Job Corps, anti-poverty efforts, regional manpower systems, other Federal manpower activities, union apprenticeships, and an assortment of private groups. Duplication, overlapping of responsibilities, and associated waste must be eliminated not because it is waste per se, but because the opportunity is thereby lost to invest resources in the training of other people much in need of this training. Eliminating external duplication of effort is a far more difficult job than monitoring the Division's own funded programs to assure that overlapping does not occur.

Internal Factors bearing on the Need. The need for a total planning system rests broadly on two overall factors, first the necessity of continual compliance with a variety of planning, programming, and budgeting requirements in the basic law of each revenue source funded or administered by the Division, and second the vital importance of a total Division-wide policy to manage the complex decision-making processes, information system, and financial management aspects of vocational education resources.

Compliance with Federal and state legal requirements is self-explanatory. Yet when compliance involves assuring that a

certain proportion of funds be directed to the needs of particular client groups, the strain on planning and management practices is considerable - particularly if combinations of applications are tested as to compliance with client constraints. When geographical considerations, the merit (on economic dimensions) of various local educational agencies, and avoidance of duplication are added to client-recipient considerations, the computational advantages in an automated planning system are enormous. These advantages are further compounded when current practices are an outgrowth of an earlier era of limited programs and funding.

The importance of a Division-wide policy is established by all the considerations outlined above which suggest how inordinately complex the management of vocational education programs has become, given expanding resources both for vocational education and other manpower training efforts. Aspects of this complexity include (1) the multiplicity of continuing and non-continuing revenue sources, (2) the fact that the management of a single revenue source may involve numerous bureaus below the Associate State Directors of Instructional Services, Administrative Services, and Ancillary Services, (3) the broad range of activity and client types, (4) the responsibility of responding both to local educational agencies as part of application processes and to Federal and state agencies in administering various revenue sources, (5) the critical difficulty of developing an information system which

will serve the entire Division for both reporting and program evaluation, (6) the varying time periods over which revenue sources are planned and operated, (7) the need to forecast changing client needs, client location, and skill requirements throughout the State and in particular areas, and (8) achieving management continuity by explicitly stating the priorities and assumptions under which the Division, the Associate Directors, and Bureaus have been operating. This complexity also results from the way management is perceived, that is, the shifting orientation of the Division, under the present Assistant Commissioner, from the single dimension of program growth to the multi-dimensional concerns of program evaluation, trade-offs between programs, and long range planning.

In sum, a planning system is required to provide continuous, comprehensive, and integrated management within the Division: continuous because a planning system would replace the intermittent examination of single revenue sources with periodic reviews of overall Division policy; comprehensive because the planning system would embrace all revenue sources managed or administered by the Division; and integrated because the planning system procedures would permit examination of each revenue source in the context of all activities designed to achieve Division-wide objectives.

Chapter III

GENERAL DESIGN CONSIDERATIONS

The Administrative Decision-Making Process of the Division

The decision-making or decisioning process of the Division involves several distinct but interrelated types of decisions. First, strategic or planning decisions must be made regarding the objectives of the Division or changes in these objectives; the resources required to obtain these objectives; and the policies that are to govern the acquisition, use and disposition of these resources. Second, management decisions must be made to assure that the resources are obtained and used effectively and efficiently in the accomplishment of the Division's objectives. Third, operations decisions must be made to assure that specific tasks are carried out effectively and efficiently.

The planning decisioning process is future oriented, that is, it is concerned with connecting present decisions to the attainment of desired future objectives. This process, ideally, embraces all resources involved in the attainment of these objectives. To put it another way, the process strives for comprehensiveness and is means-ends oriented. Therefore, the planning decisioning process not only requires past and present data, but also is dependent upon techniques that will forecast

the future based on these data. In addition to forecast procedures the planning process also makes extensive use of analytical procedures for diagnosing whether or not a problem exists and what may be the probable cause of that problem. Data used in the latter analysis are gathered through the use of formalized monitoring and evaluation procedures.

The process of making management decisions involves the programming of approved objectives in terms of specific programs and projects; the establishment of organization units to carry out the approved programs and projects; the staffing of these units; and the procurement of necessary resources. The decisions are generally spread over the entire fiscal year. They can also be found in that portion of the planning process that deals with the design of programs and projects. Ideally, management decisions form the link between the objectives made in the planning process and the programs and projects undertaken by the Division. The management decisioning process also requires the use of past and present data and the ability to analyze these data and make forecasts of the future. The analytical and forecast techniques employed in the management decisioning process, however, differ from the related techniques employed in the planning process and, hence, have their own specific data requirements.

Because the operation decisioning process is primarily concerned with assuring that specific tasks are carried out effectively and efficiently, the decisions growing out of the

process tend to predominate during the day-to-day operations of the Division. These decisions are concerned with such things as monitoring and evaluating programs and projects, professional and non-professional position controls, restrictions on transfer of monies, and so on. The purpose of these decisions is to assure adherence to predetermined standards and to assure propriety in the use of assigned resources. The operation decisioning process, as in the case with the two previously discussed processes, also utilizes past and present data. These data are gathered through the use of formalized monitoring and evaluation procedures. The data gathered during the operation decisioning process provide important inputs to the planning and management processes.

The Vocational Education Planning System outlined in this report is primarily concerned with the planning decisioning process and only secondarily concerned with the management decisioning and operation decisioning processes. The latter two processes are dealt with when they are inextricably interwoven with an element of the Planning System. The Planning System will contain data and information files and related report generation procedures, forecast procedures, indicators, and planning procedures.

The Need and the Proposed Planning System

As stated in Chapter II, the Division of Vocational Education requires a continuous, comprehensive, and integrated planning system -- a system that embodies the best of proven modern management techniques. The Division is currently administering a highly complex, broad-guaged program, that is funded from eight continuing revenue sources and innumerable non-continuing or special revenue sources. Each of these sources requires its own planning cycle. Decisions concerning the allocations of revenue from one source are frequently inextricably related to past and future allocation decisions of other revenue sources. The press of time and the amount of administrative detail required to complete each revenue source planning cycle creates a situation in which resource allocation decisions are made without the benefit of sufficient data or adequate analysis.

The Vocational Education Planning System proposed in this report will provide a formalized, sequential process that will function continuously throughout the Division's fifteen month planning cycle. This process will provide the framework within which the decisions concerning a specific revenue source can be made within the context of the total operation of the Division. The results of the evaluations of previously approved programs and projects will be utilized in the planning process. The backbone of the planning process will be the indicators -- the

main link between the evaluation of the Division's operation and the planning decisions concerning changes in these operations. A series of formalized forecast procedures will also be provided. The forecast, evaluation and planning procedures and the use of indicators will be dependent on the development of an effective data and information base and its related report generation procedures. This data base and the report generating capability will also be useful in management and operation control functions. The ability to satisfy the internal and external information requests outside the planning process will be greatly enhanced.

Multi-year plans and, where necessary, annual budgets will be produced for each revenue source by the Planning System during each planning cycle. In addition to these plans, comprehensive multi-year plans will be available for the entire Division at periodic intervals during the Division's planning cycle. The information and data in these plans will flow into the Department of Education's Planning-Programming-Budgeting System. Policy decisions made at the Department level will be communicated to the Division where appropriate changes will be made in the Division's plans. These changes, in turn, will be relayed back to the Department for use in its planning process. Thus, many links will be formed between the planning system of the Division and the planning system of the Department.

Revenue Sources, Activity Types, and Financial Constraints

One of the major specifications established by the Assistant Commissioner for the Vocational Education Planning System was the requirement that the Planning System be capable of handling the planning for all continuing and non-continuing revenue sources. For this reason a careful study was made of the revenue sources administered wholly or in part by the Division. This study lead to an examination of the activity types funded by each revenue source, and the financial constraints associated with these sources. The results of this study are contained in this section.

Revenue Source

The revenue sources controlled by the Division are derived from Federal, State and local tax sources as well as from private profit and non-profit organizations. The following federal sources are used to fund continuing operations of the Division:

1. Vocational Education Amendments of 1968 (Act 90-576),
2. Civil Defense Education Act of 1950,
3. Manpower Development and Training Act Amendments of 1969,
4. Social Security Act Amendments of 1967 (WIN),
5. Adult Basic Education Act Amendments of 1966 (Act 89-750), and
6. Veterans Administration.

Federal sources are also used to fund special projects of the Division. These sources when used in this manner are considered as non-continuing sources of revenue. Some of these sources are:

1. Vocational Education Act Amendments of 1968, Title II,
2. Economic Opportunity Act -- Residential Manpower Center,
3. Economic Development Act -- Project COED,
4. Economic Development Act -- SEED Projects,
5. U. S. Public Health Service (PL-90-174) -- new careers in health, and
6. Vocational Act Amendments of 1968 -- funds to support the development of a preliminary design for a New Jersey Vocational Education Planning System.

The State provides a number of grants-in-aid to the Division for the support of various vocational, technical and adult education programs. These sources are:

1. Vocational Education Basic Grants (Acct. #500-158-801),
2. Work Study Program (#500-168-801),
3. Technical Education (Acct. #500-157-801),
4. General Adult Education -- supervisors (Acct. #500-163-801),
5. Adult Literacy (Acct. #500-163-802),
6. Evening School for Foreign Born (Acct. #500-154-801),
7. Adult Vocational-Technical Education (Acct. #500-150-801),
8. Chapter 121, Laws of 1967-1968 and Chapter 13, and

9. Manpower Development and Training (Acct. #500-169-801).

The Division also derives state funds for its operation from the allocations approved for its portion of the State Department of Education's Budget. These monies are utilized to support the regular operation of the Division and the Department of Vocational Technical Education at Rutgers, The State University.

Local revenue is derived from two sources: (1) the portion of the local education agencies' share of the State Basic Foundation Grant that is to be spent on vocational education and (2) the local education agencies' tax effort.

Revenues are also derived from business and industry and from foundations for special projects.

The Assistant Commissioner of Vocational Education, his staff (Deputy Assistant Commissioner and the three Associate State Directors), and the State Vocational Education Advisory Council are involved in different degrees with the decisions concerning the allocation of all the above revenue sources.

In summary, the Planning System must aid the allocation of revenue from all the above revenue sources. Moreover, even though sources of revenue may be different (Federal, State, or local), and even though the use of revenue sources may be planned at different times during the year, the Planning System must recognize that overlapping activities are funded by different revenue sources. At several times during the year, a total view

over the plans for all revenue sources must be achieved to avoid duplication of effort and to fill in gaps in activity.

Revenue Sources and the Bureaus. The revenue sources administered by the Division's Bureaus are briefly discussed below:

1. Bureau of Special Needs and Cooperative Programs
   a. Federal revenues -- Vocational Education Act Amendments of 1968 (Parts B, G and H) and monies to pay proportion of state administration and supervision costs.
   b. State revenues -- Grants-in-Aid (Basic Grant and Work Study) and Division Budget.
2. Bureau of Program Service
   a. Federal revenues -- Vocational Education Act Amendments of 1968 (Parts B and F) and monies to pay proportion of state administration and supervision costs.
   b. State revenues -- Grants-in-Aid (Basic Grant and Technical Education) and Division Budget.
3. Bureau of Adult and Continuing Education
   a. Federal revenues -- Vocational Education Act Amendments of 1968 (Part B), Adult Basic Education Act Amendments of 1966 (Parts C and D), Social Security Act Amendments of 1967, Civil Defense Education Act of 1950, and monies to pay

proportion of state administration and supervision costs.

b. State revenues -- Grants-in-Aid (Basic Grant, General Adult Education - Supervisors, Adult Literacy Program, Foreign Born Residency Program, and Adult Vocational-Technical Education) and Division Budget.

4. Bureau of Area Vocational-Technical and Private Trade and Technical Schools

a. Federal revenues -- Vocational Education Act Amendments of 1968 (Part B), Veterans Administration, and monies to pay portion of state administration and supervision costs.

b. State revenues -- Grants-in-Aid (Basic Grant, Chapter 121 -- Laws of 1967-68, and Chapter 13) and Division Budget.

5. Bureau of Management Services

a. Federal revenue -- Monies to pay proportion of state administration and supervision costs.

b. State revenue -- Division Budget.

6. Bureau of Professional Services

a. Federal revenues -- Vocational Education Act Amendments of 1966 (Part B) and monies to pay portion of state administration and supervision costs.

b. State revenues -- Grants-in-Aid (Basic Grant) and Division Budget.

7. Bureau of Occupational Research and Development

a. Federal revenues -- Vocational Education Act Amendments of 1968 - State allotment (Parts B, C and D), Vocational Education Act Amendments of 1968 - U. S. Office of Education (Parts, C, D and I), and monies to pay portion of state administration and supervision costs.

b. State revenues -- Grants-in-Aid (Basic Grant) and Division Budget.

8. Bureau of Urban Occupational Education and Manpower Training

a. Federal revenue -- Vocational Education Act Amendments of 1968, Manpower Development and Training Act Amendments of 1969, Social Security Act Amendments of 1967, and monies to pay portion of administraiton and supervision costs.

b. State revenues -- Grants-in-Aid (Basic Grants and Manpower Development and Training) and Division Budget.

The eight continuing or major revenue sources administered by the various Bureaus within the Division are shown on Table III-A. All eight Bureaus are involved in the administration of three of the revenue sources -- Division budget, State-Grants-in-Aid and Vocational Education Act Amendments of 1968. The rest of

TABLE III-A

BUREAUS WITHIN CONTINUING REVENUE SOURCE

REVENUE SOURCE / BUREAU	DIV. BUDGET	STATE GRANT-IN-AID	VOC. ED. AMEND. 1968	CIVIL DEFENSE ED. ACT OF 1950	MANPOWER DEV. & TRAINING ACT AMEND. 1969	SOCIAL SEC. ACT AMEND. 1967	ADULT BASIC ED. ACT AMEND. 1966	VETERANS ADMNR.
BUR. OF SPECIAL NEEDS & COOPERATIVE PROG.	X	X	X					
BUREAU OF PROGRAM SERVICES	X	X	X					
BUREAU OF ADULT & CON. ED.	X	X	X	X		X	X	
BUR. OF AREA VOC.-TECH. & PR. TR. & TECH. SCHOOL	X	X	X					X
BUREAU OF MANAGEMENT SER.	X		X					
BUREAU OF PROFESSIONAL SER.	X	X	X					
BUREAU OF OCCUPATIONAL RESEARCH & DEVELOPMENT	X	X	X					
BUR. OF URBAN OCCUPATION ED. & MANPOWER TRAINING	X	X	X		X	X		

the revenue sources are jointly or separately administered by the Bureau of Adult and Continuing Education, Bureau of Area Vocational-Technical and Private Training and Technical Schools, and Bureau of Urban Occupation Education and Manpower Training.

The Planning System must contain provisions for involving all Bureaus who share in the administration of a given revenue source to share in its planning. Because a Bureau administers more than one revenue source, the Planning System must be so designed that Bureaus can separate their different planning roles throughout the year. Moerover, at several times during the year, the Planning System must also allow each Bureau to obtain a total view of all the funds from all the revenue sources it administers.

Special Revenue Sources by Project. In addition to the continuing revenue sources which are used to support the continuing operations of the Division, a number of non-continuing revenue sources are tapped from time to time to support special projects. The following is a partial listing of these revenue sources and the projects they support:

1. Economic Opportunity Act -- New Jersey Residential Manpower Training Center, Project COED, LEA construction projects;
2. Ford Foundation Grant -- Technology for Children;
3. U. S. Public Health Service (PL-90-174) -- Newark New Careers in Health;

4. Manpower Development and Training Act Amendments of 1969 -- SEED Projects;

5. Adult Basic Education Act Amendments of 1966 - Project 309; and

6. Multiple revenue funding -- Newark Skills Center.

The Division's operations are subdivided among five categories of activities: Instruction-General, Instruction-Occupation, Work Study, Facilities, and Ancillary. The following is a list of the activity types by category:

1. Instruction-General
   a. Elementary - "Awareness of Vocations and World of Work"
   b. Adult - Basic
   c. Adult - General
   d. Civil Defense Education
   e. Occupational Orientation
   f. Homemaking and Consumer Education
2. Instruction-Occupation -- this category contains 72 activity types (occupations within levels and within student types).
   a. Student Types -- Regular, Disadvantaged, and Handicapped
   b. Level -- Secondary, Post-Secondary and Adult
   c. Occupation - Specific -- Agriculture, Office Occupations, Distributive Education, Health

Occupations, Vocation-Industrial Occupations, Technical Education and Home Economics Occupations.

3. Work Study
4. Facilities
   a. Specialized High School
   b. General Comprehensive High School
   c. Area Vocational-Technical School
   d. Skills Center
   e. Post-Secondary -- Two Year Colleges and Four Year Colleges and Universities
   f. Residential Center
5. Ancillary
   a. Vocational Guidance Counselling and Career Development
   b. Research and Evaluation
   c. Teacher Recruitment, Training and Certification
   d. Curriculum and Instructional Media Development
   e. Program Development, Evaluation, Supervision and Administration
   f. Management and Planning Service -- Division level
   g. Information Accumulation and Dissemination

The activity types and the revenue sources that provide funds for each type are shown on Table III-B. An examination of this Table reveals that a heavy concentration of activity types can be found under the following revenue sources: State Grants-

TABLE III-B

ACTIVITY TYPE WITHIN CONTINUING REVENUE SOURCE[1]

(PAGE 1 OF 4)

ACTIVITY TYPE \ REVENUE SOURCE	DIV. BUDG.	ST. GRANT IN AID	VOC.-ED. ACT AMEND. 1968									CIVIL DEF. ED. ACT 1950	MDTA AMEND '69				SOC. SEC. ACT AMEND. 1967 (WIN)	ADULT BASIC ED. ACT AMEND. 1966		VET. ADM.	OTHER
			TITLE I								II		TITLE					PARTS			
			B	C	D	E	F	G	H	I	-		I	II				C	D		
													-	A	C	E					
1. INSTRUCTION - GENERAL																					
A. ELEMENTARY-AWARENESS OF VOCATIONS AND WORLD OF WORK"		X		X	X																X
B. ADULT-BASIC		X											X	X		X	X	X	X		
C. ADULT-GENERAL		X																			
D. CIVIL DEFENSE TRAINING												X									
E. OCCUPATIONAL ORIENTATION		X		X	X	X															
F. HOMEMAKING AND CONSUMER ED.		X		X				X													
2. INSTRUCTION - OCCUPATION																					
A. SECONDARY (REG., DISADVTG. & HANDICAPPED)																					
(1) AGRICULTURE		X		X	X	X				X	X										
(2) OFFICE OCCUPATIONS		X		X	X	X				X	X										
(3) DISTRIBUTIVE ED.		X		X	X	X			X	X											
(4) HEALTH OCCUPATIONS		X		X	X	X			X	X											
(5) VOCATIONAL INDR. ED.		X		X	X	X			X	X											

TABLE III-B (CONT'D)

(PAGE 2 OF 4)

REVENUE SOURCE / ACTIVITY TYPE	DIV. BUDG.	ST. GRANT IN AID	VOC.-ED. ACT AMEND. 1968									CIVIL DEF. ED. ACT 1950	MDTA AMEND '69				SOC. SEC. ACT AMEND. 1967 (WIN)	ADULT BASIC ED. ACT AMEND. 1966 PARTS		VET. ADM.	OTHER
			TITLE I								II		TITLE								
			B	C	D	E	F	G	H	I			I	II				C	D		
													–	A	C	E					
(6) TECHNICAL EDUCATION		X	X	X	X			X	X												
(7) HOME ECONOMICS OCC.		X	X	X	X		X	X	X												
B. POST SECONDARY (REG., DISADVTG. & HANDICAPPED)[2] (1) AGRICULTURE		X	X	X	X			X	X				X	X		X	X				
(2) BUSINESS EDUCATION		X	X	X	X			X	X				X	X	X	X	X				
(3) DISTRIBUTIVE EDUCATION		X	X	X	X			X	X												
(4) HEALTH OCCUPATIONS		X	X	X	X			X	X				X	X	X	X	X				
(5) VOCATIONAL INDUS. ED.		X	X	X	X			X	X				X	X	X	X	X				
(6) TECHNICAL ED.		X	X	X	X			X	X				X	X	X	X	X				
(7) HOME ECON. OCCUPATIONS		X	X	X	X		X	X	X				X	X	X	X	X				
C. ADULT (REG., DISADVTG & HANDICAPPED) (1) AGRICULTURE		X	X	X	X								X		X	X	X				
(2) BUSINESS EDUCATION		X	X	X	X								X		X	X	X				
(3) DISTRIBUTIVE ED.		X	X	X	X								X		X	X	X				
(4) HEALTH OCCUPATIONS		X	X	X	X								X		X	X	X				

TABLE III-B (CONT'D)

(PAGE 3 OF 4)

REVENUE SOURCE / ACTIVITY TYPE	DIV. BUDG.	ST. GRANT IN AID	VOC.-ED. ACT AMEND. 1968									CIVIL DEF. ED. ACT 1950	MDTA AMEND '69				SOC. SEC. ACT AMEND. 1967 (WIN)	ADULT BASIC ED. ACT AMEND. 1966		VET. ADM.	OTHER
			TITLE I								II		TITLE					PARTS			
			B	C	D	E	F	G	H	I	-		I	II				C	D		
													-	A	C	E					
(5) VOCATIONAL INDUS. ED.		X	X	X	X								X		X	X	X				
(6) TECHNICAL ED.		X	X	X	X								X		X	X	X				
(7) HOME ECON. OCC.		X	X	X	X		X						X		X	X	X				
3. WORK STUDY (DISADVANTAGED)									X												
4. FACILITIES A. SPECIALIZED HIGH SCHOOLS		X	X																		
B. GENERAL HIGH SCHOOLS		X	X																		
C. AREA VOC.-TECH. SCHOOLS		X	X																		
D. SKILL CENTERS		X													X	X					X
E. POST SECONDARY			X																		X
F. RESIDENTIAL CENTERS		X			X																
G. EXPERIMENTAL & DEMONSTRATIVE																					X
5. ANCILLARY A. VOCATIONAL GUIDANCE COUNSELING & CAREER DEV.	X	X	X	X	X		X	X			X		X	X	X	X	X		X		
B. RESEARCH & EVALUATION	X	X	X	X									X	X					X		

TABLE III-B (CONT'D)

(PAGE 4 OF 4)

REVENUE SOURCE / ACTIVITY TYPE	DIV. BUDG.	ST. GRANT IN AID	VOC.-ED. ACT AMEND. 1968									CIVIL DEF. ED. ACT 1950	MDTA AMEND '69				SOC. SEC. ACT AMEND. 1967 (WIN)	ADULT BASIC ED. ACT AMEND. 1966		VET. ADM.	OTHER
			TITLE I								II		TITLE					PARTS			
			B	C	D	E	F	G	H	I	-		I	II				C	D		
													-	A	C	E					
C. TEACH. RECRUIT. TR. & CERT.	X	X	X	X	X		X	X			X		X								
D. CURRICULUM & MEDIA DEV.	X	X	X	X	X		X	X		X			X				X		X		
E. PROG. DEV., EVAL., SUP. & ADMN.	X		X	X	X		X	X	X[3]	X		X			X	X	X	X	X	X	
F. MANAGEMENT & PLANNING SER.	X		X										X					X			
G. INFORMATION ACCUMULATION & DISSEMINATION	X	X	X	X	X		X	X		X		X					X	X	X		

[1]LOCAL REVENUE CAN BE A POTENTIAL SUPPORT OF ANY PROGRAM WITHIN A GIVEN ACTIVITY.

[2]THIS SUB-CATEGORY INVOLVES A FURTHER SUBDIVISION INTO JOB CLASSES. TECHNICAL EDUCATION, PARTICULARLY, WILL REQUIRE FURTHER SUBDIVISION.

[3]STATE LEVEL SUPERVISION ONLY.

in-Aid, Vocational Education Act Amendments of 1968, Manpower Development and Training Act of 1969, Social Security Amendments of 1967, and Adult Basic Act Amendments of 1966.

The Planning System must accommodate the fact that more than one revenue source may fund the same activity type. Because of this overlap in the funding of activities, the Planning System must produce a total view across all revenue sources several times during the planning cycle. Decisions about the use of a revenue source for activities may then be made in the context of what other revenue sources will be spending for the same or different activities.

Financial Constraints

Two kinds of constraints on the operation of the Division form part of the input to the planning process:

1. Decisions made within the Division by the Assistant Commissioner and his staff in consultation with the Bureau heads regarding the establishment of priorities for the Division and the allocation of its resources to achieve these priorities.
2. Decisions made outside the Division by local education agencies and State and Federal authorities that restrict the Division in the establishment of its priorities and the allocation of its resources to achieve these priorities.

These constraints may be "hard" or "soft", i.e., for all practical purposes some act as constraints while others are more flexible. These constraints will be specified during the detailed designing of the Planning System. Constraints will be drawn from such areas as:

1. Statutory and regulatory requirements;
2. Revenue sources;
3. Staff characteristics and availability;
4. Students characteristics;
5. LEA and area characteristics;
6. Plant -- space available; and
7. Availability of supplies, materials and equipment.

The preliminary design work leading up to the writing of this report, however, has uncovered a number of significant financial constraints relevant to three Federal revenue sources: Vocational Education Acts Amendments of 1968, Manpower Development and Training Act Amendments of 1969, and Adult Basic Education Act Amendments of 1966. The following is a list of these constraints:

1. Vocational Education Act Amendments of 1968
   a. Part B
      (1) Percent of allotment for vocational education of a disadvantaged person must be equal to or greater than 15 percent.

(2) Percent of allotment for vocational education of handicapped persons must be equal to or greater than 10 percent.

(3) Percent of allotment for post secondary vocational education must be equal to or greater than 15 percent.

(4) State and local effort must be maintained.

(5) State and local matching must be equal to or greater than 50 percent.

b. Part C

(1) Matching for State Research Coordinating Unit (Bureau of Occupational Research and Development) must be equal to or greater than 25 percent.

(2) State and local matching for other Part C research project must be equal to or greater than 10 percent.

c. Part D -- no project may exceed three years in duration.

d. Part F

(1) Percent of allotment for consumer and homemaking education in economically depressed areas or areas with high rates of unemployment must be equal to or greater than 33 percent.

(2) State and local matching for projects under Part F must be equal to or greater than 10 percent through 1972 and 50 percent thereafter.

e. Part H

(1) State and local effort must be maintained for work study program expenditures.

(2) State and local matching for students' wages in work study programs must be equal to or greater than 20 percent.

2. Manpower Development and Training Act Amendments of 1969 -- Part B

a. Funds for training programs must be allocated on an areal basis as defined by the State Department of Labor.

b. Training and work experience programs shall be carried out wherever possible in Skill Centers.

3. Adult Basic Education Act Amendments of 1966

a. Part C

(1) First priority must be given to programs providing instruction in speaking, reading, or writing the English language for persons at or below the fifth grade level of literacy.

(2) State and local effort for vocational education related to the purposes of this Act must be maintained at their present levels.

(3) State and local matching must be equal to or greater than 10 percent.

b. Part D -- Teacher training grants may not exceed one year in duration.

The Planning System must incorporate forecasts of possible future constraint violations so that appropriate decisions may be taken to conform to the constraints.

Planning, Decision-Making and Report Producing Considerations

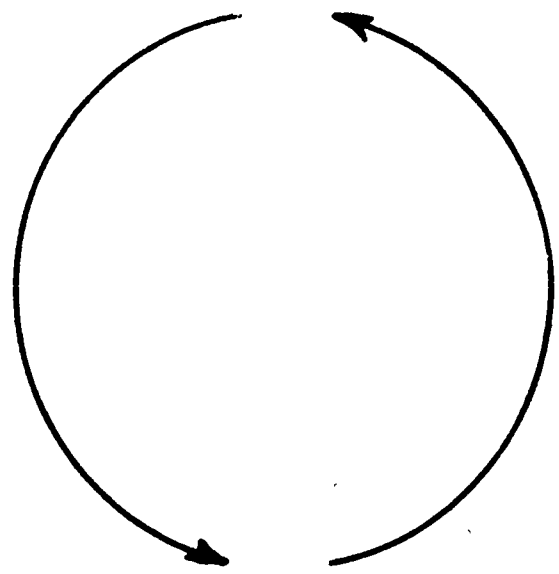
Planning is a cyclical process. This fact is graphically illustrated on Chart III-A. The Assistant Commissioner and his staff establish guidelines in consultation with the Bureau heads. The personnel of the Bureaus then conduct detailed planning in accordance with these guidelines. Proposed tentative plans are then reviewed by the Assistant Commissioner and his staff. If changes are desired in the plans the Bureaus are directed to make these changes, adjust the tentative plan, and communicate this information to the Assistant Commissioner and his staff. The process continues until a plan has been approved. Because of the cyclical nature of the planning process, it is imperative that a formalized set of planning procedures be established for each continuing revenue source and a set of generalized procedures for

CHART III-A

PLANNING - A CYCLICAL PROCESS

ASSISTANT COMMISSIONER ESTABLISHES GUIDELINES
IN CONSULTATION WITH BUREAUS AND
REVIEWS TENTATIVE PLAN

GUIDELINES



TENTATIVE PLAN

BUREAUS CONDUCT DETAILED PLANNING IN
ACCORDANCE WITH GUIDELINES AND
PROPOSE TENTATIVE PLAN

the non-continuing revenue sources. If this is not done the decisioning and report producing flows will begin to break down.

Timing of Revenue Source Planning Cycle

The first step in determining the nature and extent of the planning procedures that are to be developed for each revenue source is to establish the timing of the planning cycle for each source. Table III-C shows this timing for the present fifteen month Division Planning Cycle. Note that non-continuing revenue sources have variable planning periods and therefore, are not shown on this chart. This Division Planning Cycle is graphically illustrated on Chart III-B. Overlapping occurs among the individual planning cycles of the eight continuing revenue sources. This overlapping, while not serious, must be taken into consideration in the detailed design of the Planning System for the Division.

The timing of the required LEA (local education agency) application processes for six continuing revenue sources is shown on Table III-D. The Civil Defense Education Act of 1950 and the Veterans Administration revenue sources do not require applications from LEA's. The development of planning procedures for revenue sources that permit the filing of LEA applications at any time will present special problems. Some constraints may have to be placed on the processing of these applications and some slippage will inevitably occur in the planning cycles of some of the revenue sources, particularly in the Manpower

TABLE III-C

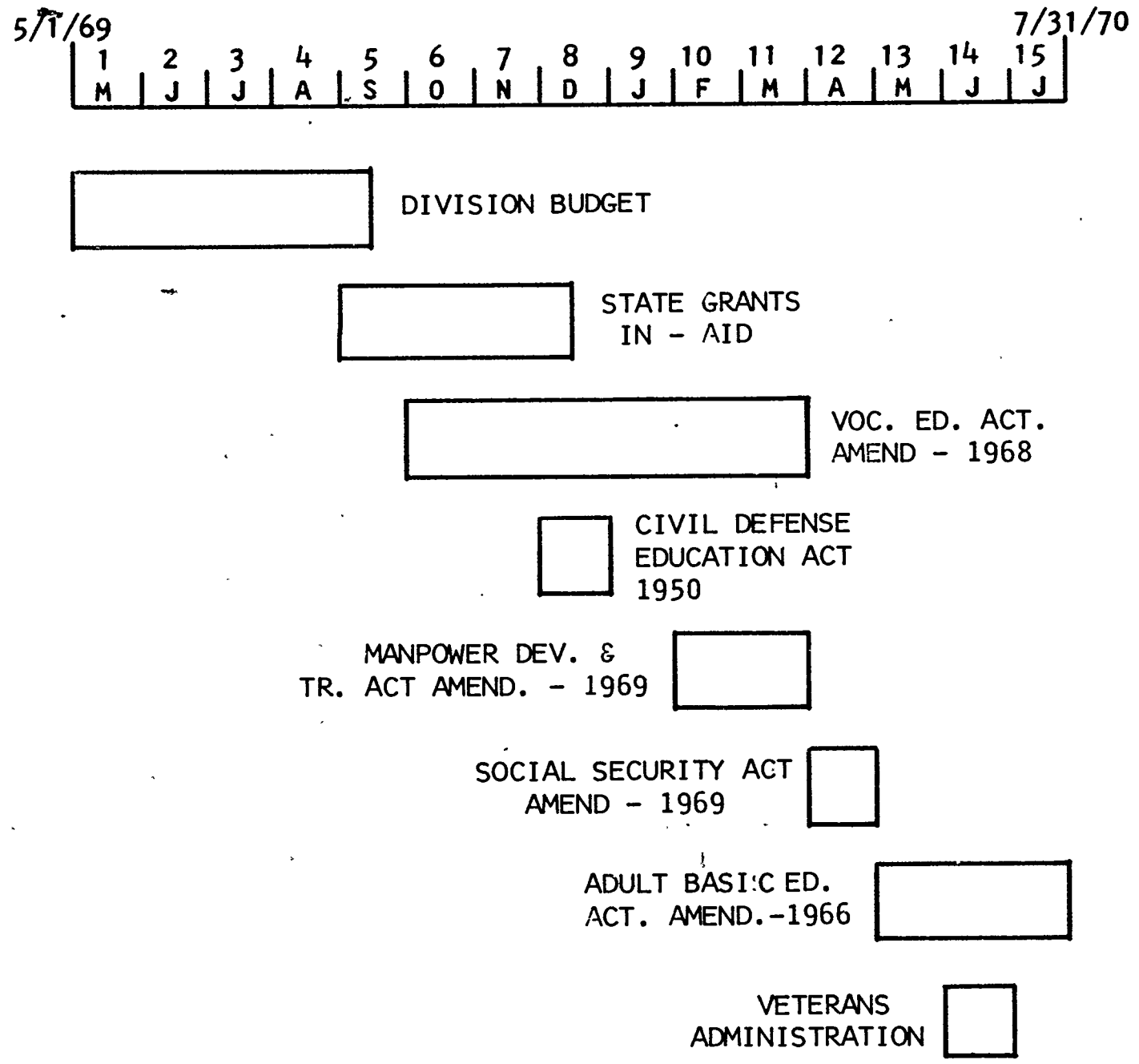
TIMING OF PLANNING PROCESS FOR CONTINUING REVENUE SOURCES*

	REVENUE SOURCE	PLANNING PERIOD	FIRST FISCAL YEAR PLANNED FOR
1.	DEPARTMENT BUDGET	5/1/69 - 9/15/69	FY 71
2.	STATE GRANTS-IN-AID	9/1/69 - 12/15/69	FY 71
3.	VOC.-ED. ACT - 1968 AMEND.	10/1/69 - 4/1/70	FY 71
4.	CIVIL DEFENSE EDUCATION	12/1/69	CALENDAR YEAR 1970
5.	MANPOWER DEVELOPMENT AND TRAINING ACT - AS AMENDED 1969	2/1/70 - 4/1/70	FY 71
6.	SOCIAL SEC. ACT AMEND. 1967	4/1/70 - 5/1/70	FY 71
7.	ADULT BASIC EDUCATION ACT - AMENDED 1966	5/1/70 - 8/1/70	FY 71
8.	VETERANS ADMINISTRATION	6/1/70 - 7/1/70	FY 71

*NON-CONTINUING REVENUE SOURCES HAVE VARIABLE PLANNING PERIODS.

CHART III - B

FIFTEEN MONTH PLANNING CYCLE OF THE DIVISION *



* ONLY CONTINUING REVENUE SOURCES ARE SHOWN

TABLE III-D

TIMING OF REQUIRED LEA APPLICATION PROCESSES

(PAGE 1 OF 2)

REVENUE SOURCE	DUE DATE OF APPLICATION	FISCAL YEAR APPLIED FOR
1. DIVISION BUDGET		
A. TEACHER, TRAINING - RUTGERS UNIVERSITY	5/1/69	FY 71
2. STATE GRANTS-IN-AID[1]		
A. ADULT EDUCATION - SUPERVISORS	10/31/69	FY 71
B. ADULT LITERACY	10/31/70	FY 71
C. EVENING SCHOOL FOR FOREIGN BORN	1970-71 LEA BUDGET - REIMBURSEMENT REQUESTED	FY 71
D. ADULT VOCATIONAL-TECHNICAL EDUCATION	1970-71 LEA BUDGET - REIMBURSEMENT REQUESTED[2]	FY 71
3. VOCATIONAL-EDUCATION ACT AMEND. - 1968		
A. PART B		
(1) OPERATIONS	12/1/69	FY 71
(2) CONSTRUCTION	MAY FORMALLY APPLY ANYTIME[3]	FY 71
B. PART C	NO DATE YET ESTABLISHED	FY 71
C. PART D	12/1/69	FY 71
D. PART F	12/1/69	FY 71
E. PART G	12/1/69	FY 71

TABLE III-D (CONT'D)
(PAGE 2 OF 2)

REVENUE SOURCE	DUE DATE OF APPLICATION	FISCAL YEAR APPLIED FOR
F. PART H	12/1/69	FY 71
4. MANPOWER DEVELOPMENT AND TRAINING ACT - AMEND. - 1969		
A. PART B	MAY FORMALLY APPLY ANYTIME[4]	CURRENT FISCAL YEAR
B. PART C	MAY FORMALLY APPLY ANYTIME[4]	CURRENT FISCAL YEAR
5. SOCIAL SECURITY ACT AMEND. 1969		
A. WIN - MDT	MAY FORMALLY APPLY ANYTIME[4]	CURRENT FISCAL YEAR
B. WIN - ADULT BASIC EDUCATION AND HIGH SCHOOL EQUIVALENCY	6/1/70 - 8/1/70[5]	FY 71
6. ADULT BASIC EDUCATION ACT AMEND. 1966 --		
A. PART C	6/1/70 - 8/1/70[5]	FY 71

[1]PROCESSED AS APPLICATIONS ATHAT ARE SEPARATE FROM OTHER APPLICATIONS OF OTHER REVENUE SOURCES.

[2]APPLICATIONS FOR REIMBURSEMENT ARE MADE THROUGH THE TREASURY DEPARTMENT.

[3]INFORMAL ESTIMATES ARE GATHERED BY THE DIVISION IN NOVEMBER.

[4]INFORMAL ESTIMATES GATHERED BY THE DIVISION IN MARCH, APRIL AND MAY.

[5]DEPENDS ON WHETHER APPLICATION IS FOR A SUMMER PROGRAM OR FOR A SCHOOL YEAR -- INFORMAL ESTIMATES GATHERED BY THE DIVISION IN APRIL AND MAY.

Development and Training Act Amendments of 1969 and the Social Security Act Amendments of 1967. Special consideration will also be given to the planning procedures concerned with the gathering of informal estimates of possible applications for the four continuing Federal revenue sources shown on the table.

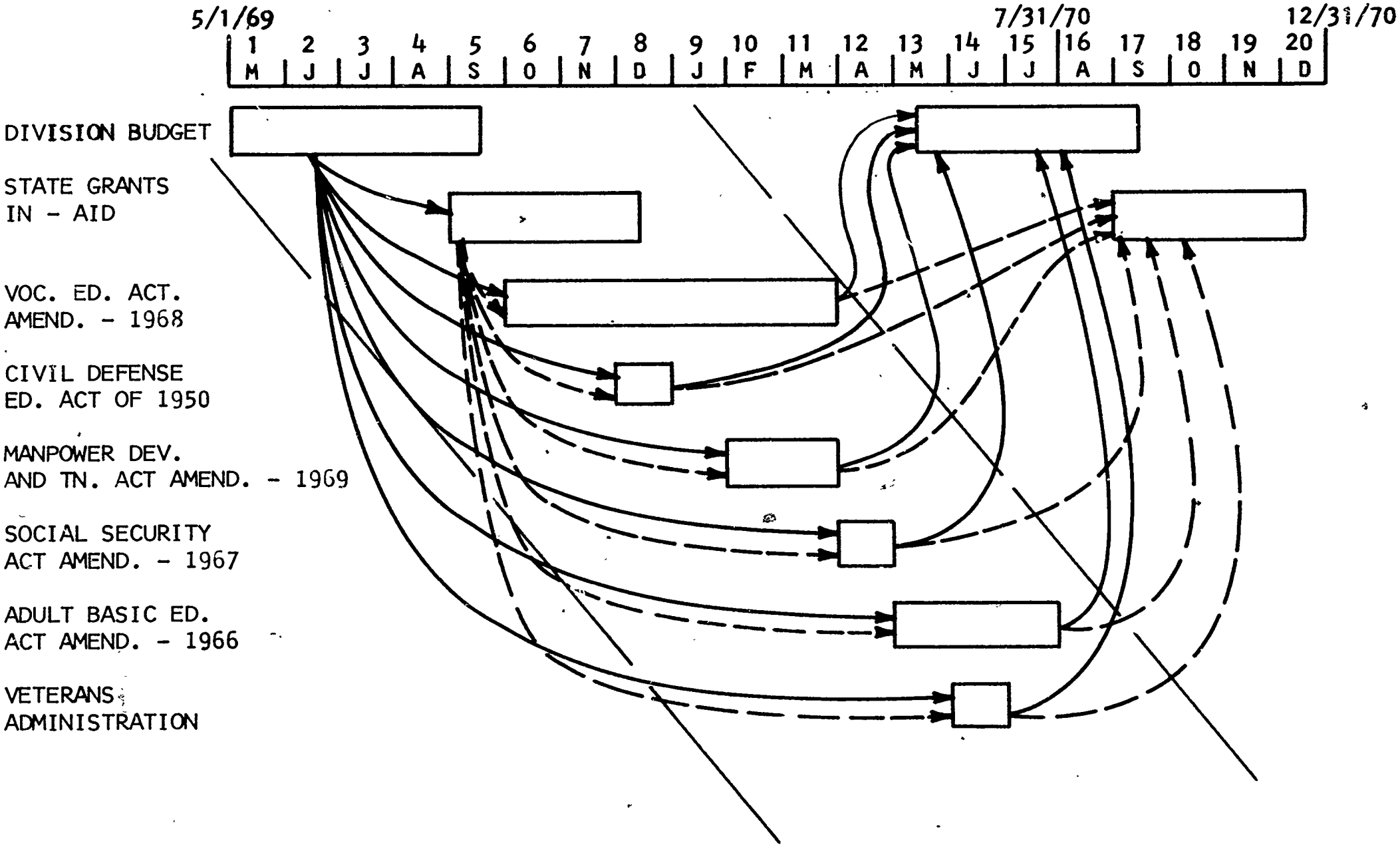
Decision-Making

Planning decisions are made for each revenue source, that is, decisions are made concerning how these revenues shall be expended and for what purposes. As emphasized throughout this chapter and in Chapter II, these decisions must be made in the context of previous decisions and knowledge of possible future decisions for all other revenue sources. For example, planning decisions made during the present planning cycle of the Division for the Vocational Education Act Amendments of 1968 Revenue Source will be influenced by the plans developed earlier in the cycle for the Division Budget and State Grants-in-Aid revenue sources. The plans of the other Federal revenue sources are less important because they were developed during the previous planning cycle and are, therefore, subject to modification during the present planning cycle.

Chart III-C shows the interdependency of State and Federal revenue sources. The decisions made during the planning cycle for the Division Budget Revenue Source are concerned, in part, with the allocation of State revenue across ancillary activities partially funded by Federal revenue sources. State Grants-in-Aid

CHART III - C

INTERDEPENDENCY OF STATE AND FEDERAL REVENUE SOURCES



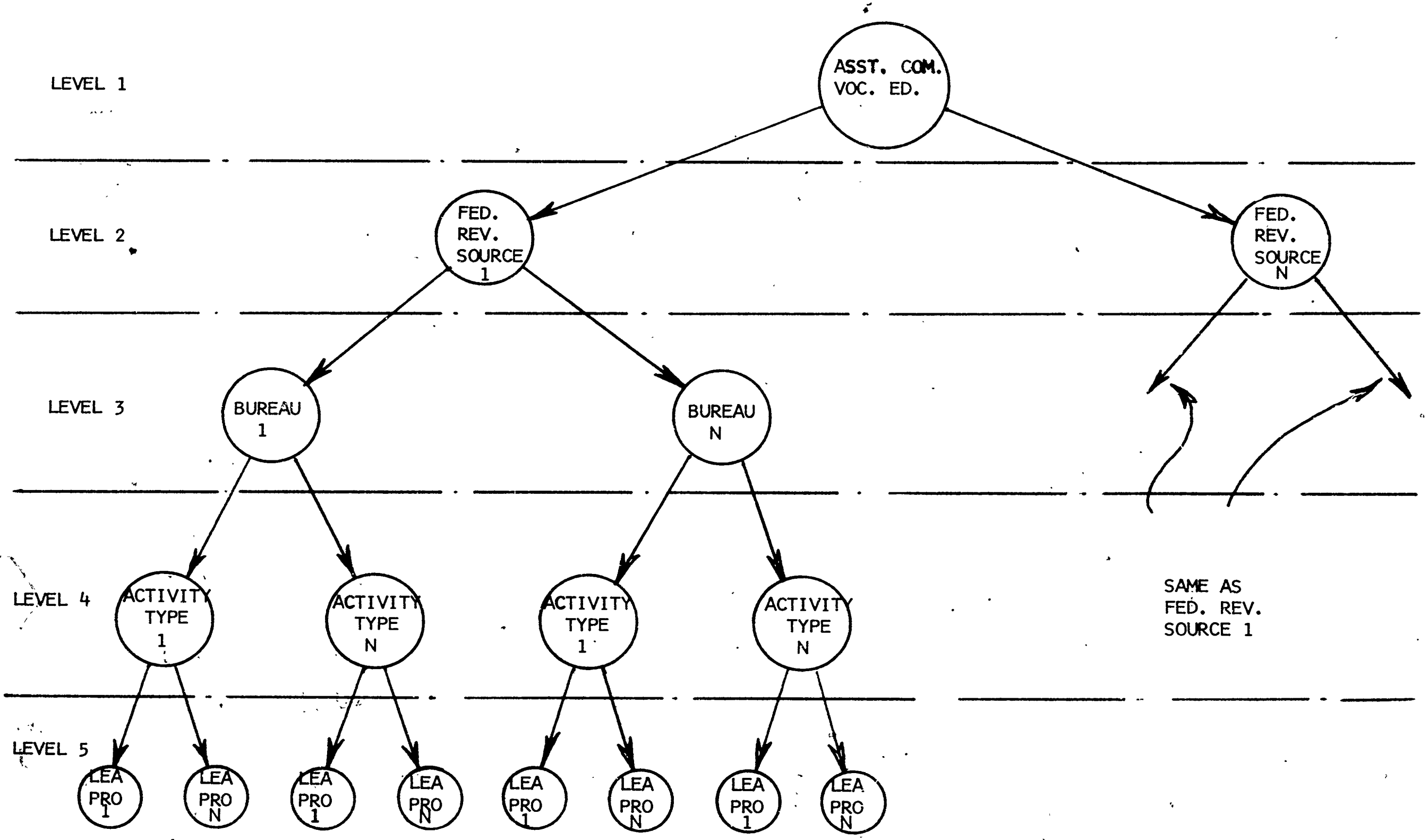
Revenue Source planning decisions are concerned with the allocation of state revenue across activities that are partially funded by Federal and State revenue resources. Therefore, the decisions made regarding the two State revenue sources influence the resource allocation decisions made for the Federal revenue sources. At the conclusion of the present Division planning cycle (that portion of the chart enclosed within the diagonal lines) the decisions reflected in the plans for the six Federal revenue sources will influence the decisions made concerning the plans for the two State revenue sources during the next planning cycle.

The decisions made for the Federal revenue sources are concerned with allocating Federal revenue across activity types by organization level, that is, by state and LEA. Decisions are also made concerning the allocation of resources within activity by LEA, by area, and by student characteristics.

The decision-making flow is illustrated on Chart III-D. An example will suffice to demonstrate how this decision-making flow operates from level to level. The Assistant Commissioner and his staff in consultation with the Bureau heads makes a decision regarding the allocation of resources under Federal Revenue Source 1. This decision involves the allocation of resources to instructional programs for disadvantaged students that come under Activity Type 1. The decision acts as a constraint on Bureau 1 as it reviews LEA instructional applications falling under Activity Type 1.

CHART III-D

DECISION-MAKING
FLOWS FOR FEDERAL REVENUE SOURCES



Decisions are made at each decision point (circles on Chart III-D) concerning the relative emphases to be placed at lower levels in the decisioning process. The Assistant Commissioner and his staff make planning decisions concerning the relative emphasis to be placed on various client groups, areas, or revenue sources. Bureau heads and their staffs make planning decisions with respect to the relative emphasis to be placed on activity types within revenue sources and by activity type in terms of accepting or rejecting LEA applications. The types of decisions and the decision flows have been taken into consideration in the general design of the Planning System.

Reports

Two types of reports are necessary to the planning and decision-making phases -- Decision Point and Level. For example, the Decision Point Report summarizes (refer to Chart III-D) all LEA programs under Activity Type 1, of Bureau 1, and of Federal Revenue Source 1. A Level Report summarizes all activities by Bureau (Level 3). This is accomplished by adding together all the decision points at Level 3. The only meaningful level reports are:

1. Bureau -- expenditures, programs and clients served by Bureau. These reports are necessary because some Bureaus appear under different revenue sources. For example, funds from the Vocational Technical Education

Act Amendments of 1968 are utilized by all eight Bureaus.

2. Activity Type -- expenditures, programs and clients served by activity type. These reports are necessary because some activity types appear under different Bureau's revenue sources. Adult Basic Instruction by occupation type, guidance, and teacher training, illustrate this point (refer to Tables III-A and III-B).

3. LEA -- expenditures, programs and clients by specific LEA's or LEA types, viz: school district, county vocational-technical school, area vocational-technical school, etc.

The information and data files and the report generation procedures necessary for producing these reports are incorporated in the proposed Planning System.

Proposed Indicator Types

As indicated in the opening paragraph of this chapter, sound planning is directed toward those programs and projects which accomplish the desired objectives. The device for handling objectives in the Vocational Education Planning System, as in the EPPB System described in Chapter I, is the indicator.

Three types of indicators are proposed for use with the Planning System: Social Demand, Process, and Output, Output

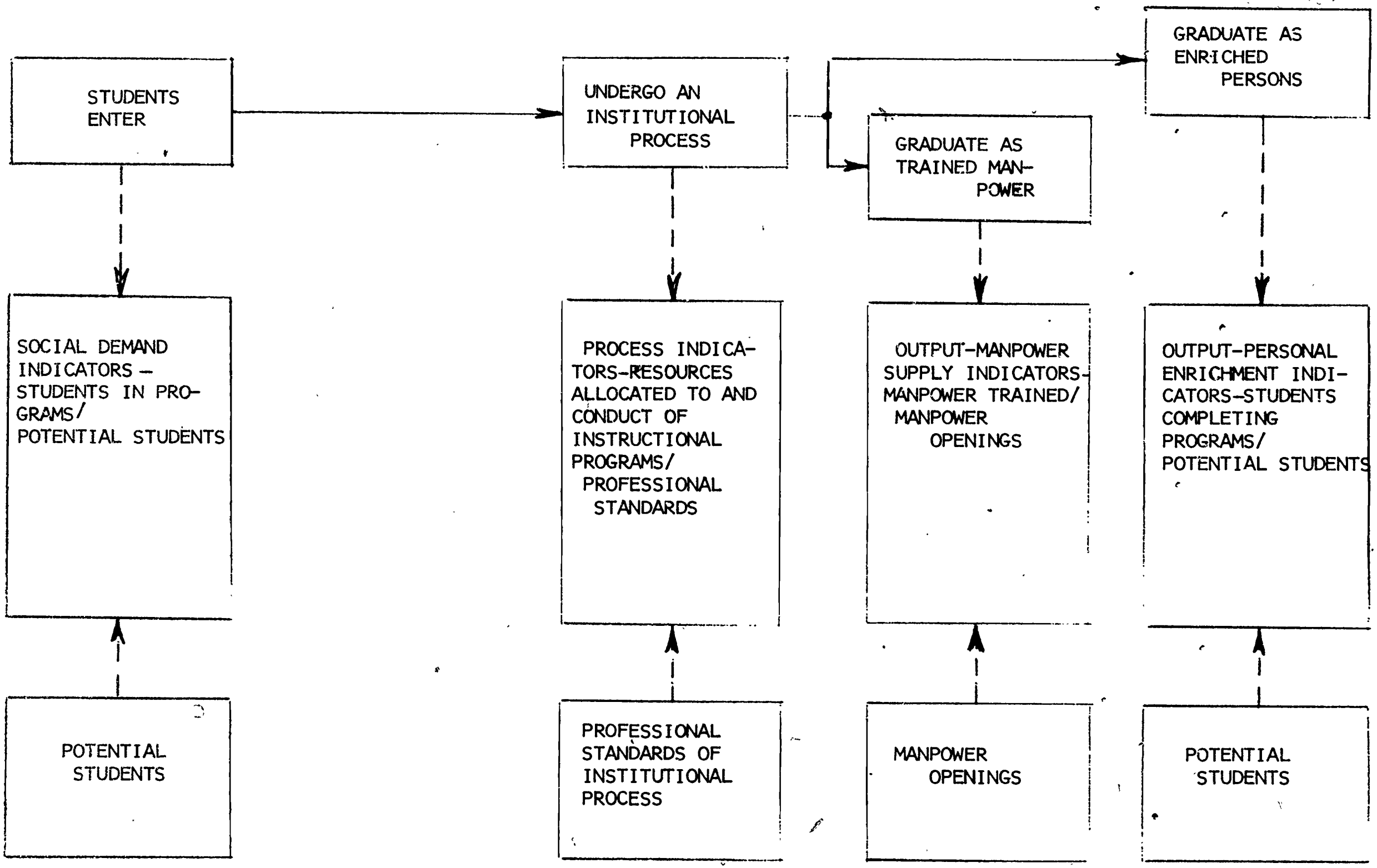
indicators being sub-divided into Manpower Supply and Personal Enrichment. These indicators are shown on Chart III-E. There are measures of social demand for specific programs, measures of resources allocated to or conduct of these programs, and measures of outputs from these programs, such as the number of students graduating as trained manpower or as enriched persons. An indicator must be quantifiable, that is, some definite procedure must be available which tells what information and data to record and how to manipulate it so as to produce a number which represents the indicator.

The Process indicators can be subdivided into three types that are useful in planning for a specific instructional program. The types of indicators used are shown on Chart III-F. Input indicators are measures of the resources allocated to the program. Process-Quality indicators are measures of the performance of the instructional process, that is, the degree to which a given series of instructional methods and techniques are successful in terms of professional standards. Output indicators are measures of student performance. Input and Output indicators, as in the case of Process-Quality indicators, are compared to professional standards. These standards are derived from an analyses of students needs and characteristics, related normative data, current professional practices, and institutional constraints.

Figure 3A shows typical indicators and illustrates their uses. Three indicators are shown. One is a measure of social

CHART III-E

THREE TYPES OF INDICATORS USED IN THE DIVISION PLANNING PROCESS

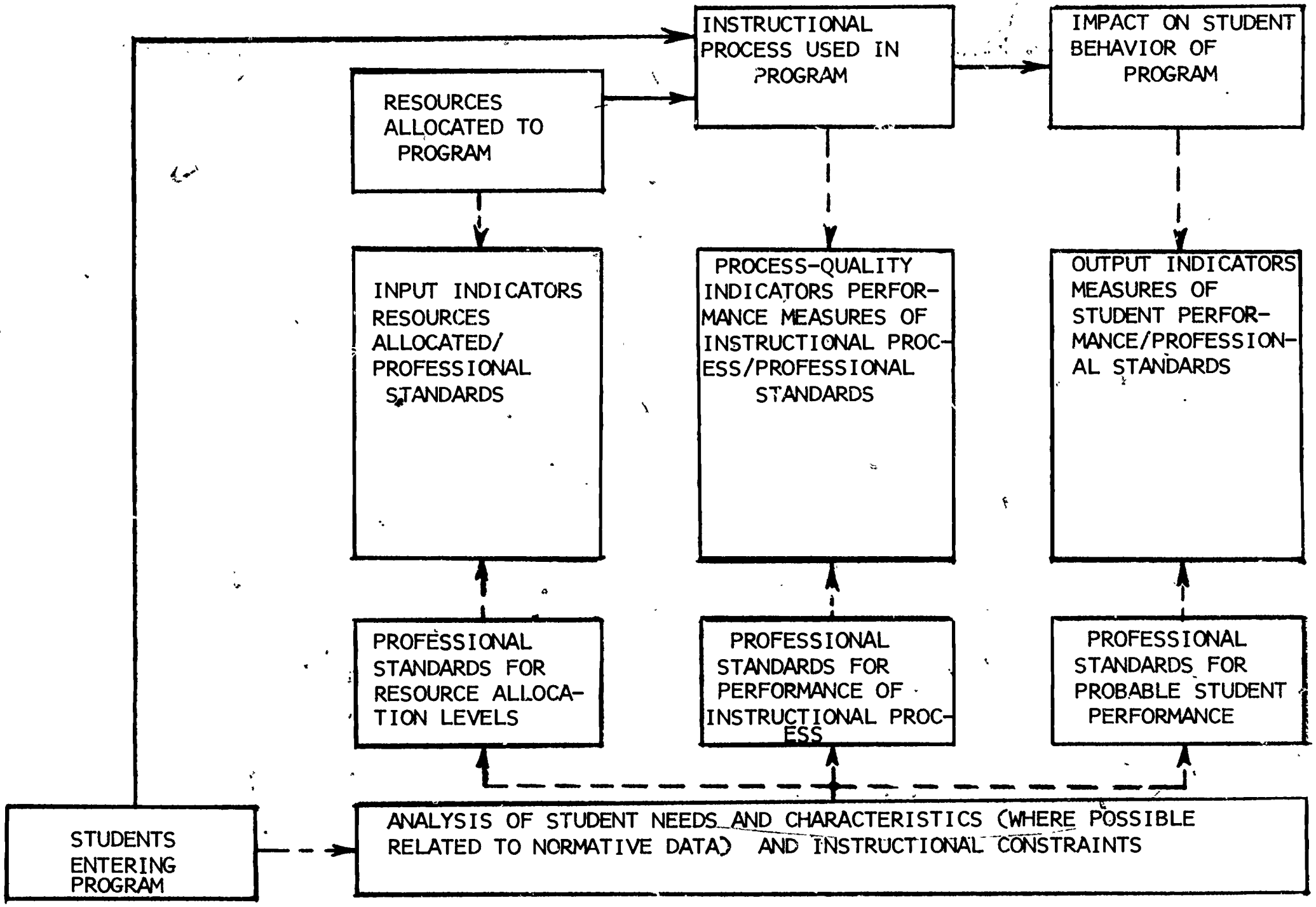


LEGEND:

PHYSICAL FLOW (-)
INFORMATION FLOW (--)

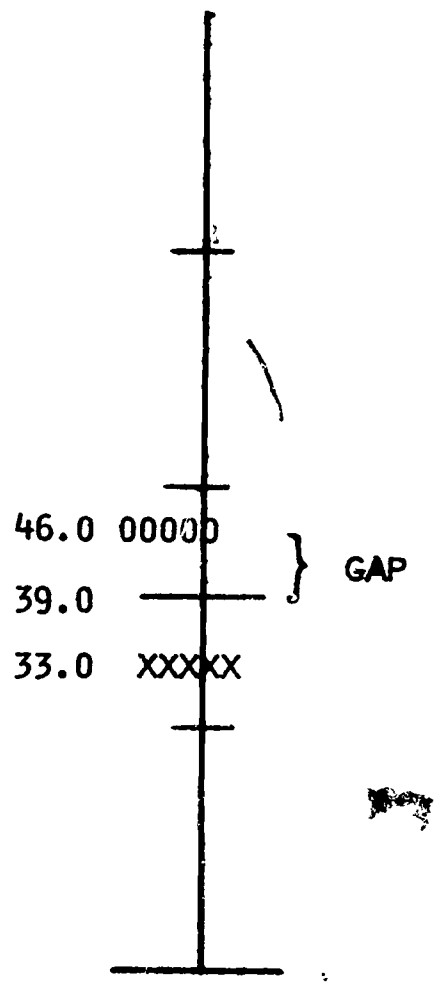
CHART III-F

THREE TYPES OF INDICATORS USED IN THE PROCESS OF PLANNING AN INSTRUCTIONAL PROGRAM

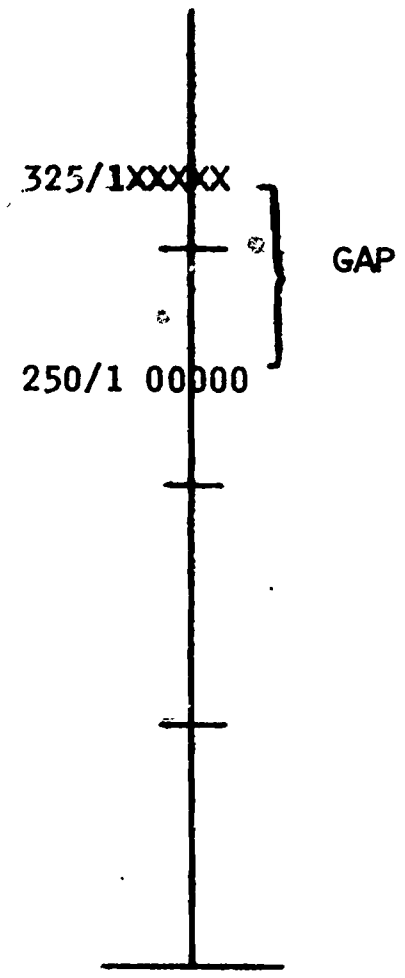


LEGEND:

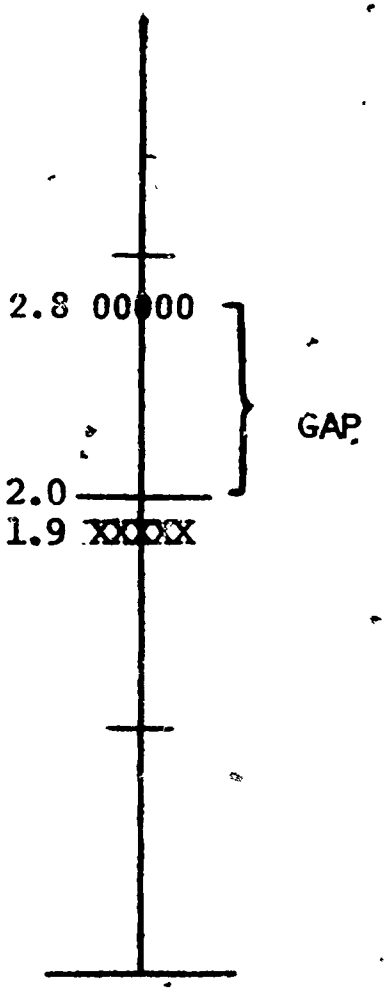
PHYSICAL FLOW (—)
INFORMATION FLOW (- -)



PERCENTAGE OF URBAN SECONDARY SCHOOL STUDENTS (GRADES 9-12) ENROLLED IN VOCATIONAL EDUCATION



VOCATIONAL STUDENT GUIDANCE COUNSELOR RATIO FOR URBAN STUDENTS



PERCENTAGE OF URBAN SECONDARY SCHOOL STUDENTS ENTERING POST-SECONDARY VOCATIONAL PROGRAMS

LEGEND:

PRESENT	(XXXXX)
EXPECTED BY YEAR 5	(———)
DESIRED	(00000)

FIG. 3-A. ILLUSTRATIVE INDICATORS AND A GRAPHIC DISPLAY OF THEIR GAPS.

demand -- "Percentage of urban secondary school students (grades 9-12) enrolled in vocational education". The second indicator is a measure of a resource input and provides part of the basis for examining the level of resources for a specific program in terms of the desired benefits and effects to be achieved -- "Vocational students/vocational guidance counselor for urban students". The third indicator measures output which contributes to the measure of the performance of vocational instructional programs and guidance counselling programs for urban students -- "Percentage of urban secondary school students entering post secondary vocational programs".

An examination of the output indicator will be useful in explaining the concepts of present or actual, expected and desired levels of an indicator as well as the indicator gap. The present level of the indicator was derived from the survey of the previous year's graduating class of urban secondary school students. Of the students formally enrolled in vocational education at the secondary level, 1.9 percent entered post secondary vocational programs. The expected level of the indicator (2.0 percent) is derived from a formalized procedure which involves the professional staff of the Division and consultants and is based on the assumption that no modifications are to be made in the present set of urban vocational instructional programs and vocational guidance programs. The desired level (2.8 percent) is also derived from a similar formalized process. The desired estimate represents the best

professional judgment of achievable reality if certain conditions are met, that is, if certain programs are instituted.

The difference between the five-year expected level and the desired level is called the "gap". The objective is to close the gap. To put it another way, to undertake programs which will cause the expected level at some specific point in time to come as close as possible to the desired level.

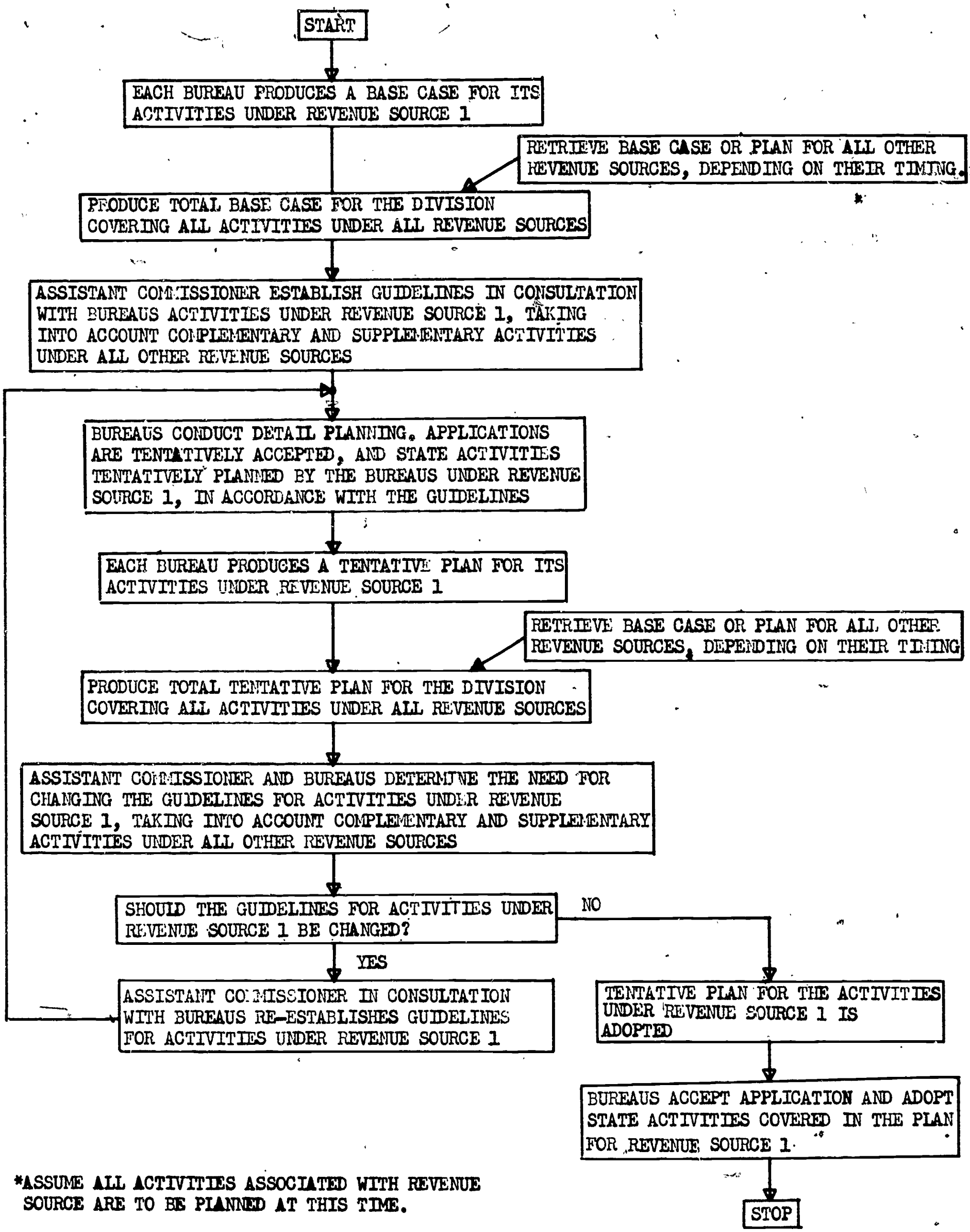
Proposed Planning Cycle

Chart III-G shows the proposed planning cycle for a revenue source. This cycle is based on the assumption that all activities associated with the revenue source are to be planned during the period of the cycle. The cycle begins with each Bureau producing a Base Case for its activities under Revenue Source 1.

While the Base Case has been defined in Chapter I, a brief review of its definition will be useful at this point. The Base Case is an updated version of the Current Plan for the revenue source, the Current Plan having been produced during the previous planning cycle of the Division. Updating is necessary because of changes, such as, enrollment shifts, lack of staff, salary increases, construction delays, etc. The Base Case contains a projection of indicator levels and cost, and a determination of financial feasibility under the assumption that no new planning decisions will be made over the next multi-year planning horizon.

CHART III-G

PLANNING CYCLE FOR A REVENUE SOURCE*



*ASSUME ALL ACTIVITIES ASSOCIATED WITH REVENUE SOURCE ARE TO BE PLANNED AT THIS TIME.

Base Cases or New Plans for all other revenue sources are retrieved. (Revenue sources that have completed their planning cycles during the present Division planning cycle provide New Plans at this point.) The Base Cases and New Plans are combined to produce total Base Case for the Division which covers all activities under all revenue sources. The total Division Base Case is reviewed by the Assistant Commissioner and his staff in consultation with the Bureau heads. The results of this review are guidelines to be used in the development of a New Plan for Revenue Source 1. These guidelines will take into account complementary and supplementary activities under all other revenue sources.

Working within the guidelines the personnel of the individual Bureaus begin the detailed planning process for Revenue Source 1. LEA applications are tentatively accepted and State activities tentatively planned. Each Bureau produces a Tentative Plan for its activities under Revenue Source 1. Base Cases or New Plans for all other revenue sources are retrieved. The Tentative Plan for each Bureau is combined with the Base Cases and New Plans for all other revenue sources. Thus, producing a total Tentative Plan for the Division that covers all activities under all revenue sources.

The Tentative Plan is reviewed by the Assistant Commissioner and his staff in consultation with Bureau heads. The purpose of this procedure is to determine the need for changing the guidelines for activities under Revenue Source 1, while taking

into account the complementary and supplementary activities under all other revenue sources. If the decision is made to change the guidelines for activities under Revenue Source 1, the changes are communicated back to the Bureaus where the detailed planning process begins again. If the guidelines are not changed and the Tentative Plan is accepted, the Bureaus are instructed to accept applications and adopt State activities covered under the Tentative Plan (now called the New Plan) for Revenue Source 1, thus, ending the planning cycle for Revenue Source 1.

Before a discussion can be undertaken concerning the application of the proposed planning cycle to the eight continuing revenue sources, an examination of a hypothetical set of four revenue sources will be useful. The planning cycles for four revenue sources is illustrated in Chart III-H and Table III-E. At the start of the planning for Revenue Source 1, the view across all of the revenue sources includes Base Cases (updated Current Plans which were developed during the previous planning cycle) for all revenue sources. The view across the four revenue sources at the start of the planning for Revenue Source 2 shows a completed plan for Revenue Source 1 and Revised Base Cases for Revenue Sources 2, 3 and 4. Revised Base Cases are Base Cases that reflect minor changes resulting from Revenue Source 1's Plan or no change if the Plan doesn't cause any changes in Revenue Sources 2, 3 or 4. The planning cycle follows the same pattern for Revenue Sources 3 and 4. In this example the total view of the organization's activities over the four revenue sources can

CHART III-H

PLANNING CYCLE FOR FOUR REVENUE SOURCES

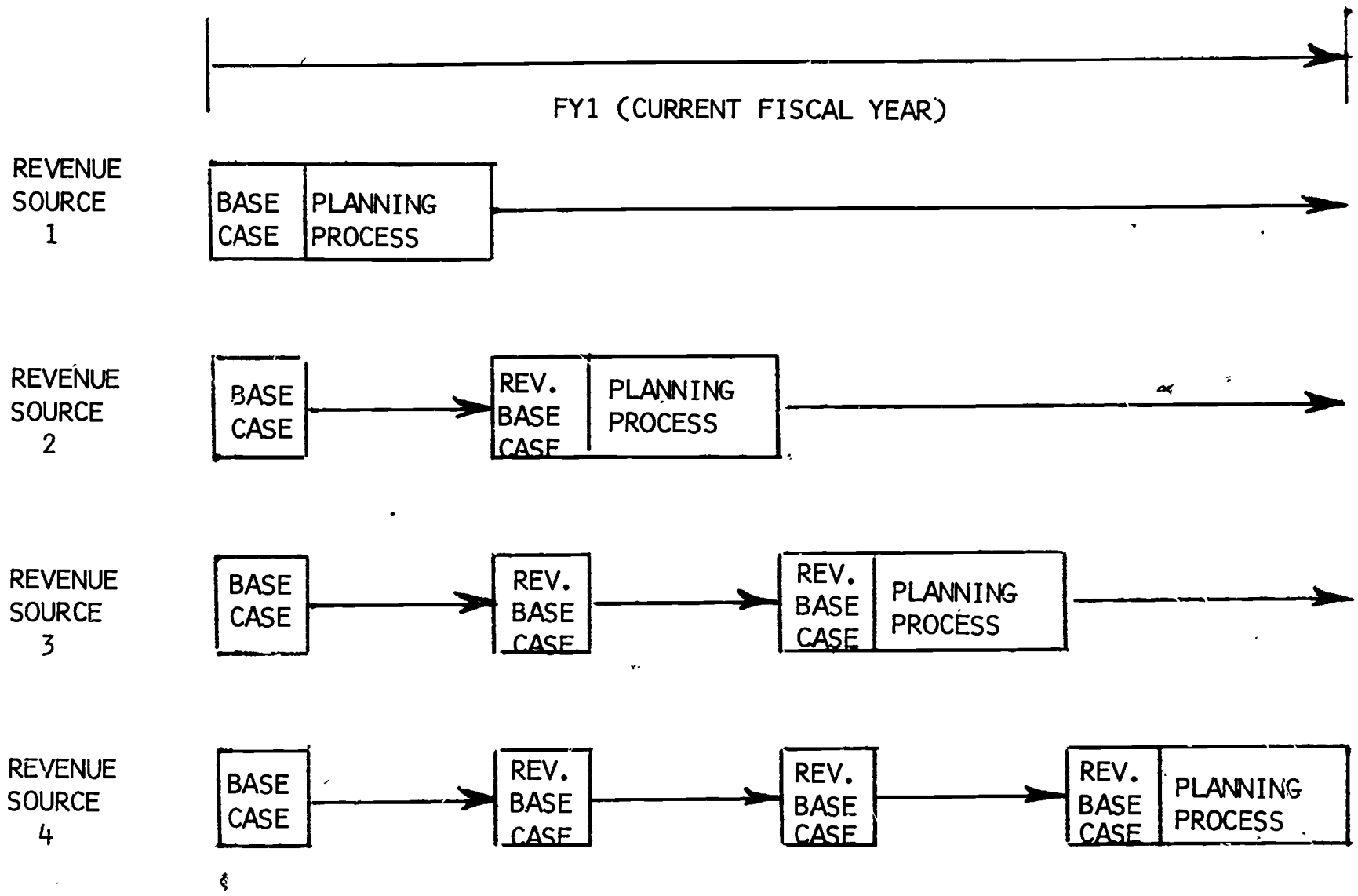


TABLE III-E

TOTAL VIEW OF THE PLANNING CYCLE FOR FOUR REVENUE SOURCES

REVENUE SOURCE		1	2	3	4
1	Start	Base Case	Base Case	Base Case	Base Case
	During	Plan	Base Case	Base Case	Base Case
2	Start	Plan	Revised Base Case	Revised Base Case	Revised Base Case
	During	Plan	Plan	Revised Base Case	Revised Base Case
3	Start	Plan	Plan	Revised Base Case	Revised Base Case
	During	Plan	Plan	Plan	Revised Base Case
4	Start	Plan	Plan	Plan	Revised Base Case
	During	Plan	Plan	Plan	Plan

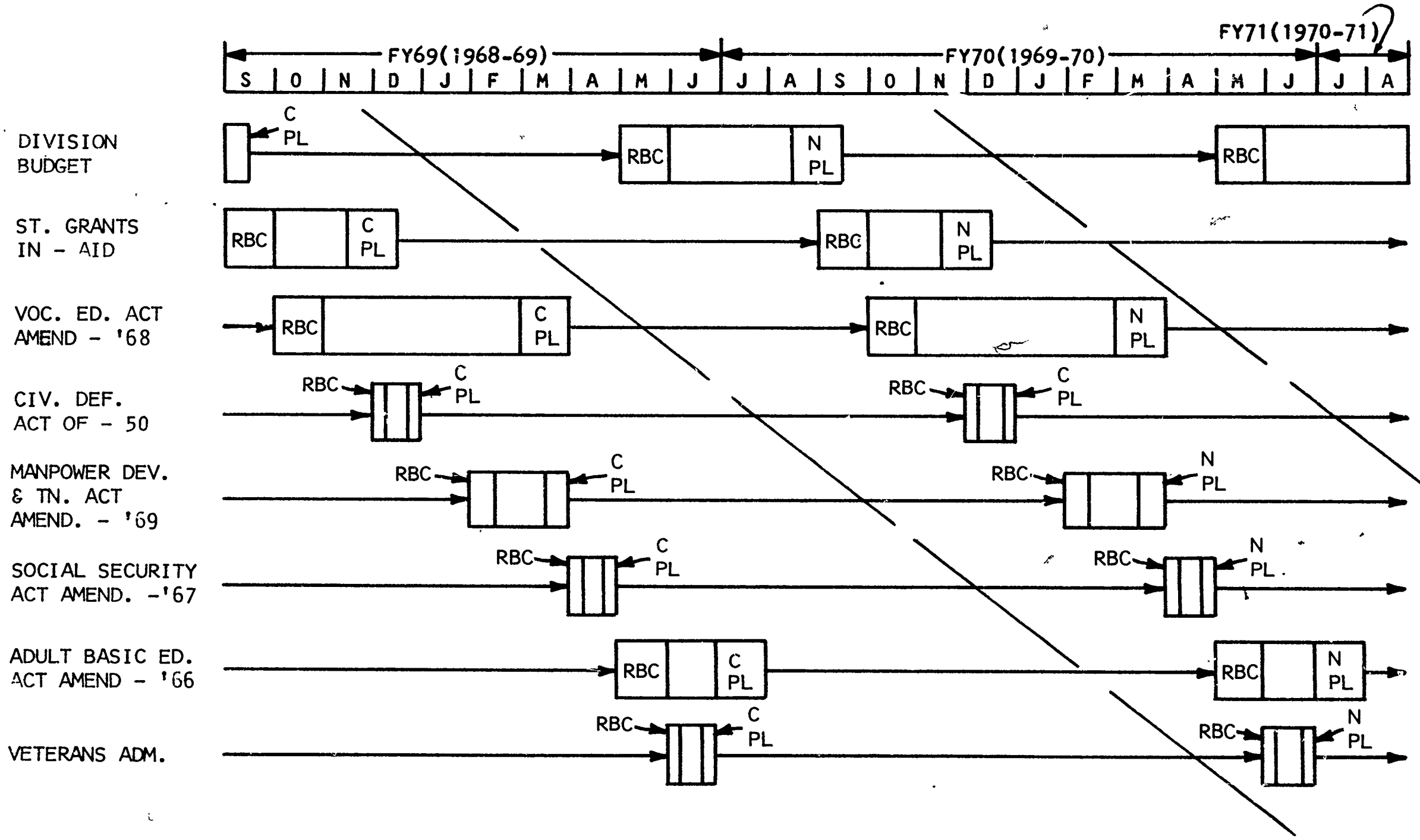
be presented at least eight times during the four planning cycles. The cyclical character of planning for the Division is shown on Chart III-I. The present fifteen month planning cycle for the Division is shown on the Chart between the diagonal lines. Note that there is an overlap between two successive planning cycles. This overlap problem, as in the cases of the overlap among the individual planning cycles of the revenue sources, must be taken into consideration during the detailed designing of the Vocational Education Planning System.

For ease of explanation, the planning process for each revenue source is subdivided into two parts -- Base Case Phase and Alternative Set Phase. The Base Case Phase embraces all those activities in the planning cycle leading up to and including the evaluation of the Revised Base Case by the Assistant Commissioner and his staff in consultation with the Bureau heads. The Alternative Set Phase embraces all those activities leading up to the evaluation and final selection of the New Plan by the Assistant Commissioner and his staff in consultation with the Bureau heads.

Table III-F shows a total view of the planning cycles for eight continuing revenue sources. For example, during the Base Case Phase of the planning cycle for Revenue Source 1 a Revised Base Case (updated Current Plan) is developed for Revenue Sources 1 through 8. During the Alternative Set Phase of the cycle for Revenue Source 1 a New Plan is generated for Revenue Source 1 in terms of the Revised Base Cases for Revenue Sources 2 through 8.

CHART III - I

DIVISION'S PRESENT FIFTEEN MONTH PLANNING CYCLE SHOWING REVISED BASE CASES AND CURRENT AND NEW PLANS *



* REVISED BASE CASES ARE PREVIOUS PLANS UPDATED.
CURRENT PLANS WERE DEVELOPED DURING THE PREVIOUS FIFTEEN MONTH DIVISION PLANNING CYCLE.
NEW PLANS ARE BEING DEVELOPED DURING THE PRESENT FIFTEEN MONTH DIVISION PLANNING CYCLE.

TABLE III-F

TOTAL VIEW OF THE PLANNING CYCLES FOR THE CONTINUING REVENUE SOURCES

(PAGE 1 OF 2)

REVENUE SOURCE	REVENUE SOURCE / PLAN CYCLE PH.	#1	#2	#3	#4	#5	#6	#7	#8
1. DIV. BUDG.	BASE CASE PHASE	REVISED BASE CASE OR CURR. PLAN							→
	ALTERNATIVE SET PHASE	NEW PLAN	REVISED BASE CASE CURRENT PL.						→
2. STATE GRANT IN-AID	BASE CASE PHASE	NEW PLAN	REVISED BASE CASE OR CURR.PL.						→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.					→
3. VOC.-ED. ACT AMEND. OF 1968	BASE CASE PHASE	NEW PLAN	REVISED BASE CASE OR CURR.PL.						→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.		→
4. CIVIL DEF. EDUCATION	BASE CASE PHASE	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.					→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	NEW PLAN	REVISED BASE CASE OR CURR.PL.			→

TABLE III-F (CONT'D)

(PAGE 2 OF 2)

REVENUE SOURCE	REVENUE SOURCE / PLAN CYCLE PH.	#1	#2	#3	#4	#5	#6	#7	#8
5. MANPOWER DEV. & TR. ACT AMEND. 1967	BASE CASE PHASE	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	NEW PLAN	REVISED BASE CASE OR CURR.PL.	→	→	→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	→	→	→
6. SOCIAL SEC. ACT AMEND. OF 1967	BASE CASE PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	→	→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	→
7. ADULT BASIC ED. ACT AMEND. OF 1966	BASE CASE PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN
8. VETERANS ADMNR.	BASE CASE PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	→
	ALTERNATIVE SET PHASE	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	NEW PLAN	REVISED BASE CASE OR CURR.PL.	NEW PLAN

The Base Case Phase of the planning cycle for Revenue Source 2 begins with a New Plan for Revenue Source 1 and Revised Base Cases for Revenue Sources 2 through 8. The Alternative Set Phase concludes with a New Plan for Revenue Source 2 which has been updated in terms of the New Plan for Revenue Source 1 and the Revised Base Cases for Revenue Sources 3 through 8.

The planning cycles for the balance of the revenue sources follow a similar pattern, however, note the differences that occur in certain revenue sources that commence their planning cycle after the preceding revenue source and conclude their cycle before the preceding revenue source's cycle is completed. For example, Revenue Source 7 concludes its Alternative Set Phase with a New Plan. This Plan is developed in terms of the New Plans previously developed for Revenue Sources 1 through 6, not in terms of a Revised Base Case for Revenue Source 8 but in terms of a New Plan for this source. Therefore, if the plans developed under Revenue Source 7 should have an important influence on those developed under Revenue Source 8, accommodations must be made in Revenue Source 8's New Plan.

This problem emphasizes the fact that the planning for each revenue source is accomplished by seeing: (1) the impact of the activities funded by the revenue source independent of the activities funded by the other revenue sources and (2) the impact of all activities funded under all revenue sources. To repeat, planning for activities under one revenue source must take into

account complementary and supplementary activities funded by other revenue sources and, thereby, avoid duplication of effort.

The guidelines incorporated in the planning procedures for the major revenue sources must take into account factors like the following: (1) areas -- urban vs. non-urban, high dropout rate vs. low dropout rate, and high unemployment vs. low unemployment; (2) client types -- regular, disadvantaged and handicapped; (3) occupation types -- one occupation type vs. another occupation type; and (4) instruction vs. ancillary services.

Proposed Report Generation Procedures

LEA and area report generation for any planning cycle is shown on Chart III-J. The report generation procedures will be used for the Revised Base Case and Alternative Set by revenue source and for totals across all revenue sources. The report generation procedures will also be useful at the Division level for the Assistant Commissioner and his staff and at the Bureau level for the Bureau heads and their staffs. The grid employed in the report generation procedures will not be fine, but will be sufficient to meet the basic planning requirements. The guidelines will probably follow the boundaries of existing school districts. The reports produced will include both total amounts and percentages, for example, the following reports will be generated: (1) total expenditures by school district and by county, (2) percent of total expenditure by school district and

CHART III-J

LEA AND AREA REPORT GENERATION FOR ANY PLANNING CYCLE

FILE
NEW JERSEY SLICED INTO GRID

FILE
CHARACTERISTICS OF LOCAL EDUCATIONAL AGENCIES:
(1)LOCAL EDUCATIONAL AGENCY CODE NUMBER
(2)LOCATION IN GRID
(3)TYPE OF AGENCY:
E.G., SCHOOL DISTRICT, AREA V-T, COUNTY VOC., COMMUNITY COLLEGE, ETC.
(4)TAX EFFORT, ETC.

FILE
ASSIGNMENT OF GRID "SQUARES" TO SCHOOL DISTRICTS AND TO COUNTIES

FILE
ASSIGNMENT OF GRID "SQUARES" TO LABOR MARKET AREAS

FILE
DESIGNATION OF GRID "SQUARES" AS
(1)URBAN OR NON-URBAN(SMSA)
(2)HIGH OR LOW DROP-OUT RATE
(3)HIGH OR LOW YOUTH UNEMPLOYMENT
(4)HIGH OR LOW UNEMPLOYMENT

FILE
CODE NUMBERS OF LOCAL EDUCATIONAL AGENCY APPLICATIONS IN A BASE CASE OR "TENTATIVE" PLAN

FILE
CHARACTERISTICS OF LOCAL EDUCATIONAL AGENCY APPLICATIONS:
(1)APPLICATION CODE NUMBER
(2)LOCAL EDUCATIONAL AGENCY CODE
(3)EXPECTED NUMBER OF STUDENTS BY TYPE
(4)EXPECTED GRADUATES BY TYPE OF OCCUPATION
(5)INSTRUCTIONAL QUALITY CHARACTERISTICS
(6)EXPENDITURES ETC.

REPORT GENERATOR

REPORTS ON CHARACTERISTICS OF APPLICATIONS BY CHARACTERISTICS OF AGENCIES: E.G., REPORTS ON
(1)NUMBER OF PROGRAMS BY TYPE OF AGENCY
(2)STUDENTS BY TYPE BY TYPE OF AGENCY
(3)GRADUATES BY OCCUPATION BY TYPE OF AGENCY
(4)EXPENDITURES BY TYPE OF AGENCY, ETC.

REPORTS ON CHARACTERISTICS OF APPLICATIONS BY AREA: E.G., BY SCHOOL DISTRICT, COUNTY AND BY LABOR MARKET AREA, AND BY URBAN-NON-URBAN AND BY HIGH-LOW DROP-OUT RATE, ETC., REPORTS ON
(1)NUMBER OF PROGRAMS
(2)STUDENTS BY TYPE
(3)GRADUATES BY OCCUPATION
(4)EXPENDITURES, ETC.

by county, (3) total expenditures in urban and non-urban areas, and (4) percent of total expenditures in urban and non-urban areas. Individual reports will also be generated to cover all revenue sources.

Indicators and the Planning and Evaluation Process

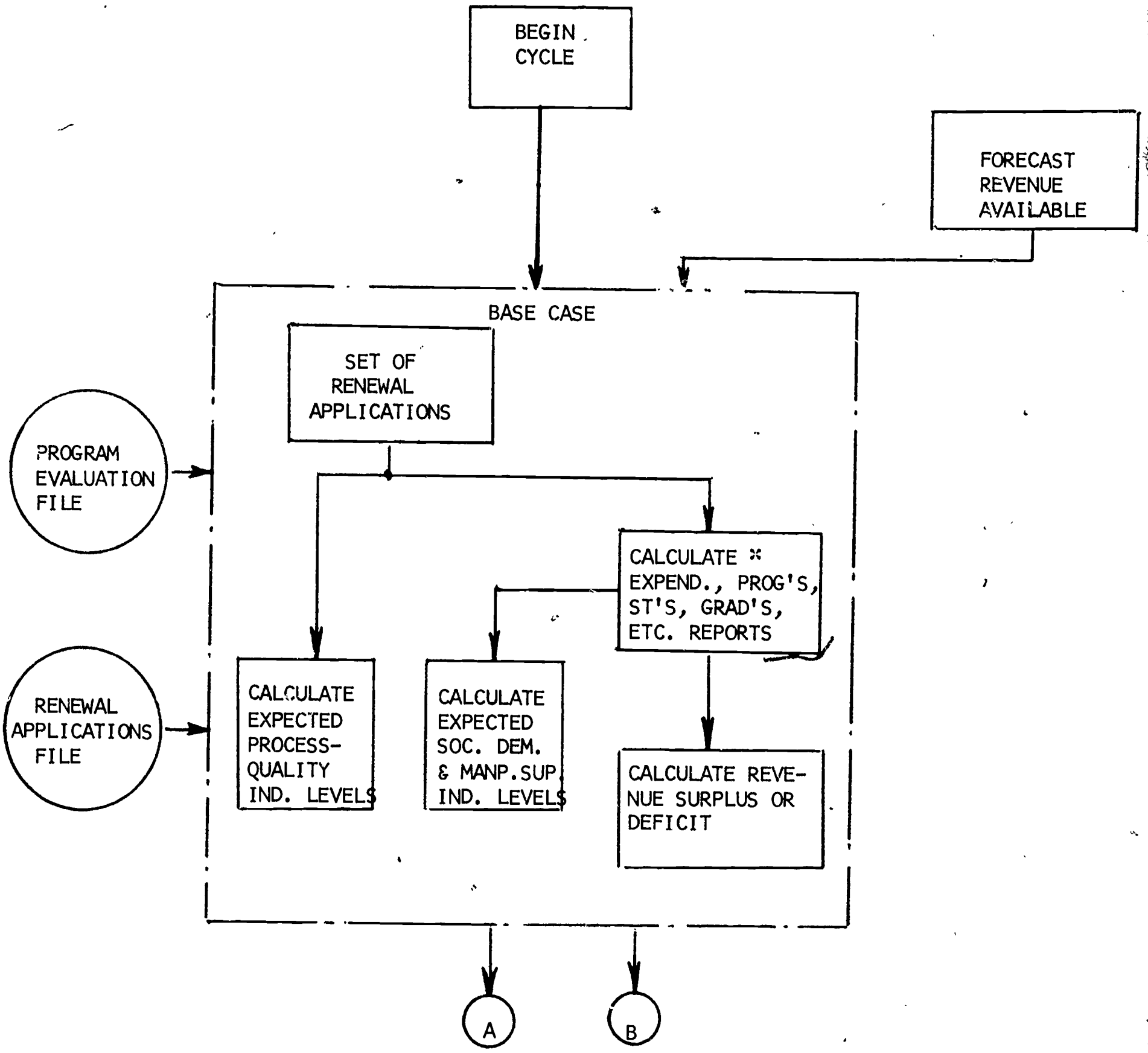
In the planning system, indicators act as the link between program evaluation and application review and approval. Chart III-K illustrates this linkage. Program evaluation gathers information and data on the success or lack of success of all presently operating programs and projects. This information is stored in the Program Evaluation File.

At the start of the planning for next year's program and projects, the current status is reviewed by calculating the present levels of all indicators. The program evaluation file provides the information to calculate present indicator levels. During the planning for the next planning period various sets of applications for renewed and new programs and projects are reviewed and evaluated by estimating the expected indicator levels of each set and comparing the expected indicator levels with desired indicator levels. The Program Evaluation File provides part of the information necessary for estimating the expected indicator levels, that is how successful programs will effect the estimate of how successful programs will be. Other

CHART III-K

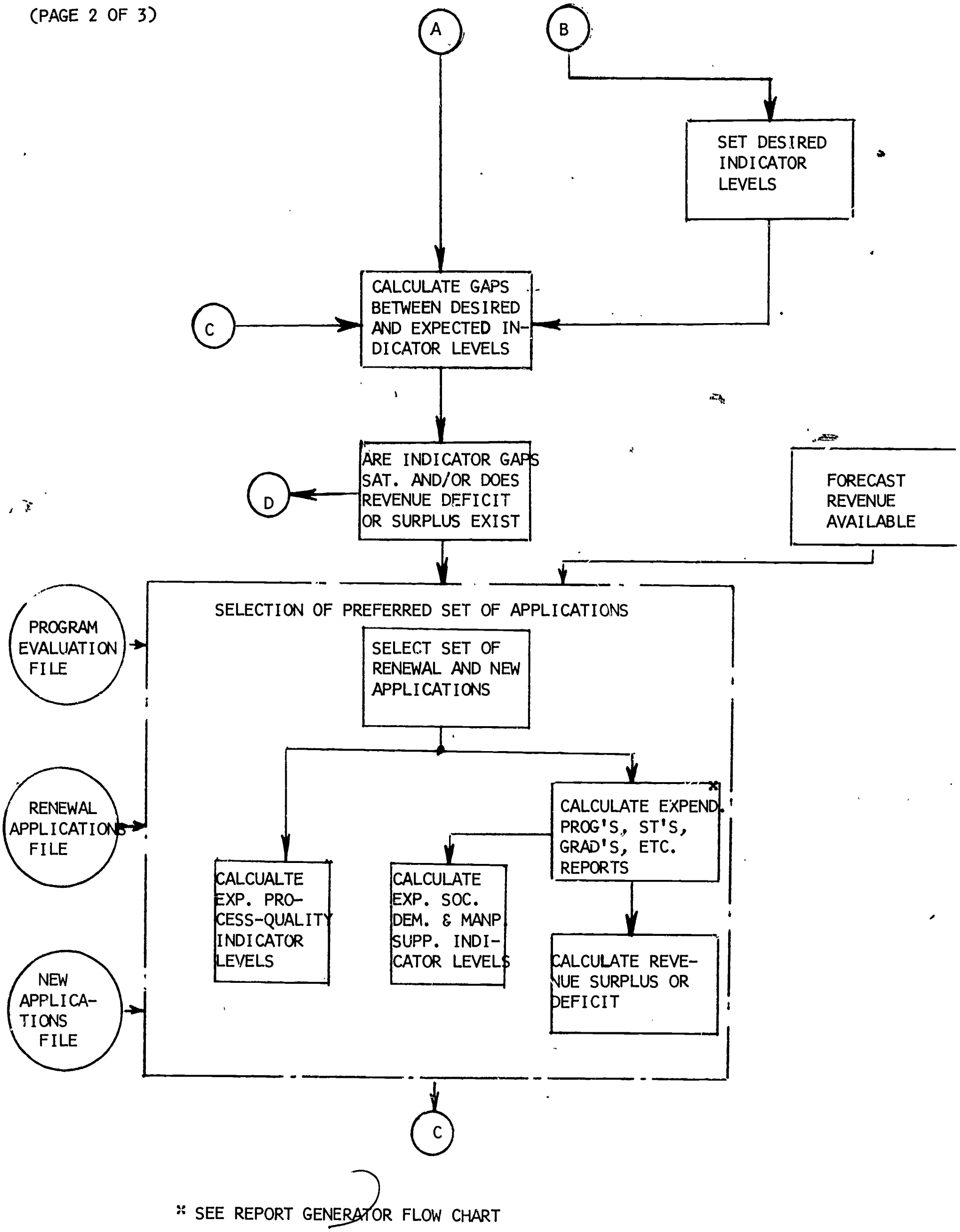
USE OF INDICATORS IN APPLICATION REVIEW AND APPROVAL AND PROGRAM EVALUATION

(PAGE 1 OF 3)



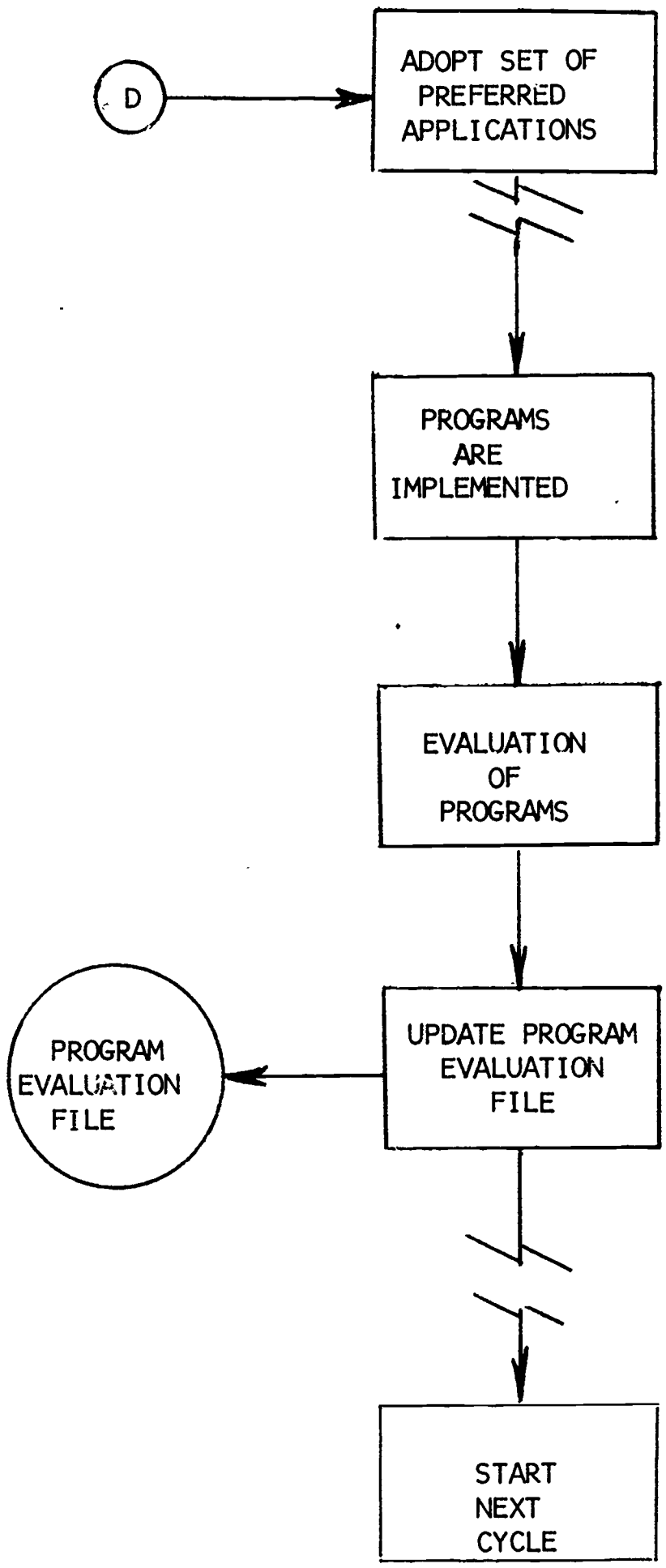
* SEE REPORT GENERATOR FLOW CHART

CHART III-K (CONT'D)
(PAGE 2 OF 3)



* SEE REPORT GENERATOR FLOW CHART

CHART III-K (CONT'D)
(PAGE 3 OF 3)



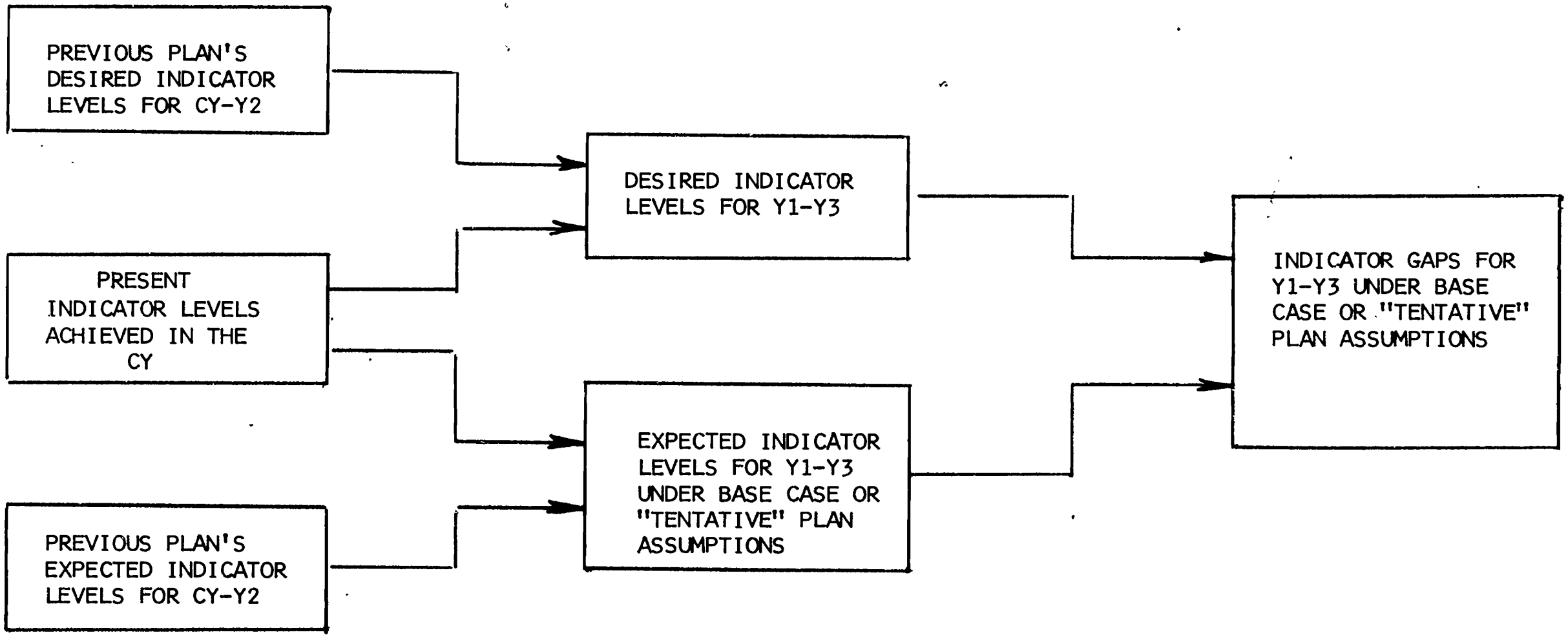
information is found in the file of applications for renewal and new program and projects.

The objectives of the Division can be stated as closing indicator gaps between expected and desired indicator levels. The setting of desired and expected indicator levels and the calculations of indicator gaps under Base Case or Tentative Plan assumptions are shown in Chart III-L. Different sets of applications for renewal and new programs and projects will have different expected indicator levels and different indicator gaps. The performance of the tasks of setting desired indicator levels and estimating expected indicator levels are critical -- upon their outcome rests, in part, the objectives and decisions concerning future programs and projects supported and conducted by the Division.

In the proposed Planning System, the process of setting desired indicator levels, of estimating expected indicator levels, and of calculating indicator gaps is multi-level. All levels of the Division take part, as shown in Chart III-M. The desired indicator levels for the total Division are set by the Assistant Commissioner and his staff. In the context of the total Division's desired indicator levels, the Assistant Commissioner and his staff set desired indicator levels for each revenue source. Continuing downward in the hierarchy, the Assistant Commissioner, his staff and the bureaus set desired levels by bureau, by revenue source in the context of desired indicator levels by revenue source. The desired indicator levels

CHART III-L

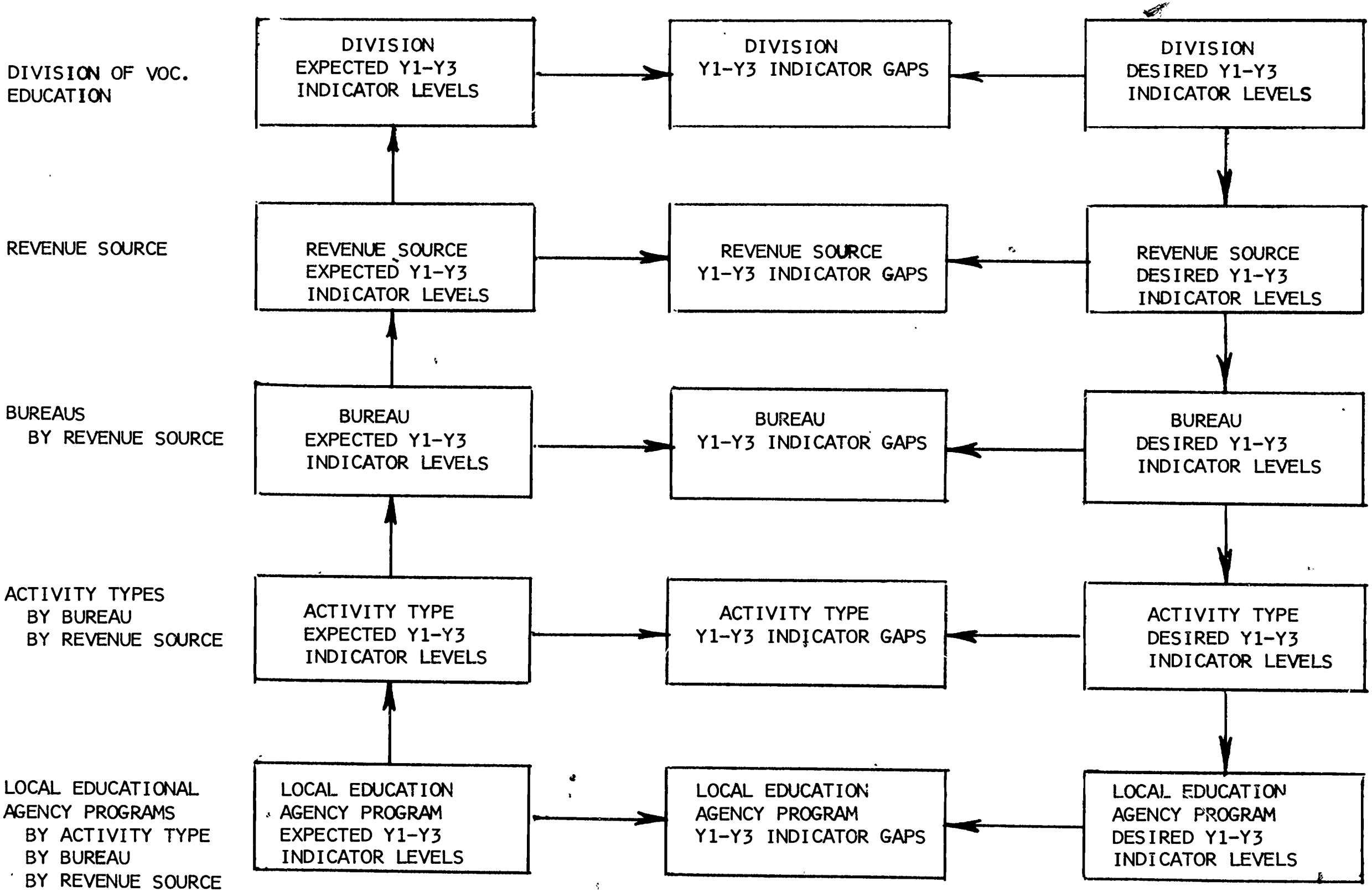
DESIRED AND EXPECTED INDICATOR LEVELS*



* TIME - CURRENT YEAR'S PLANNING CYCLE

CHART III-M

THE USE OF INDICATORS IN THE DECISION-MAKING AND REPORT FLOWS



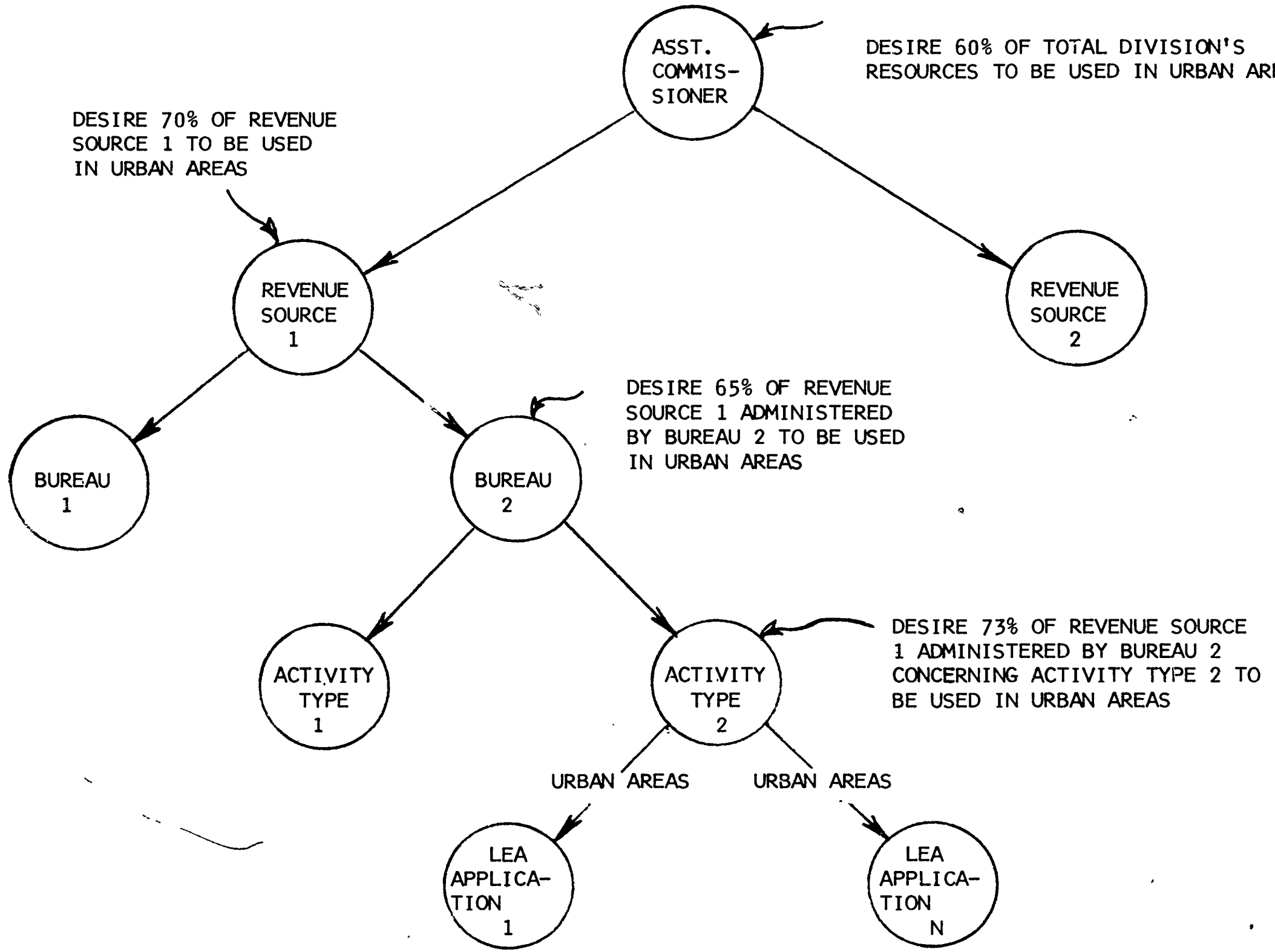
are set by activity type, by bureau, by revenue source in the context of desired indicator levels by bureau, by revenue source. These desired indicator levels form one of the bases for accepting or rejecting LEA applications and for designing state programs.

The upward flow of expected indicator levels through the hierarchy and calculation of indicator gaps at each level of the hierarchy closes the loops of the top-down-bottom-up cyclical planning process. Chart III-L also illustrates how indicator levels are used to gain a total view across bureaus by revenue source, access revenue source and across the Division.

Chart III-N is a hypothetical example of the setting of desired indicator levels downward through the hierarchy. The indicator used is "Percent expenditures in urban areas". The Assistant Commissioner and his staff might establish the goal that 60 percent of the total Division's resources are to be used in urban areas. Then, in order to pursue this goal, the Assistant Commissioner and his staff might establish a subgoal of 70 percent of the funds from Revenue Source 1 which are to be used in urban areas. Continuing downward, the Assistant Commissioner, his staff, and the bureaus might desire that 65 percent of the funds for Revenue Source 1 be administered by Bureau 2 to be used in urban areas. In the light of this subgoal, Bureau 1 might desire 73 percent of the funds of Revenue Source 1 administered by bureau 2 for Activity Type 2 to be used in urban areas. These guidelines are an important input to

CHART III-N

USE OF AN INDICATOR IN PLANNING
INDICATOR: PERCENT EXPENDITURES IN URBAN AREAS



Bureau 2's decisions concerning the acceptance and rejection of LEA applications and the design of state programs to be funded under Activity Type 2 of Revenue Source 1.

The Planning System will produce information on present indicator levels and expected indicator levels as a benchwork for the setting of desired indicator levels at all levels in the hierarchy. Charts III-L and III-M illustrate this relationship between present, expected, and desired indicator levels. In this way, the Planning System dynamically promotes improved objectives while keeping sight of the feasibility of objectives.

Input Forecasts and Projections

Introduction

From the material on input forecasts presented in Chapter I it should be clear that enrollment forecasts are of crucial importance in the workings of the EPPB System. Though revenue forecasts are of obvious significance, experience has shown us that for school districts and regional service units nothing will distort the results achieved to the same degree as errors in forecasts of the student population. Thus the EPPB System as designed provides a relatively sophisticated technique for making multi-year enrollment forecasts, even though such forecasts are annually reevaluated. While the literature and techniques for revenue forecasts were examined as part of the design of the EPPBS, the level of sophistication employed is left, however, to

the decision of the educational administrator directly involved. For the fact is that sophisticated forecasts, estimates, and projections can only be achieved at considerable expense both in terms of the design of basic methodology and data acquisition. In the design of the EPPBS a decision was made, in effect, that only for enrollments was the cost of developing a new methodology for forecasting merited.

For several reasons, pleas for sophisticated projections and forecasts are in many instances misdirected. Developers of complex models for accomplishing a variety of forecasts, normally economic, have often been unable to demonstrate the superiority of complicated techniques over simpler methods employed by experienced subject matter specialists. And cost considerations are not to be ignored. Where a forecasting model (the mehtodology) must be developed entirely from scratch with little available help from secondary sources, the cost, in contrast to the beneifts of an incremental improvement in the quality of forecasts, will frequently be prohibitive. Similar considerations apply to the data. The distinction is often made between "hard" and "soft data", with every right-thinking educator and social scientist seeking the reliable and valid "hard" data. Yet planning and budgeting systems frequently use softer data when the effort involved in obtaining more reliable numbers cannot be supported.

The importance of the methodologies and data employed must therefore be considered in the context of the total planning

system. There may be some instances where the forecasts are so critical that if reliable projections cannot be obtained the attempt to plan should be dismissed; such instances will be rare, however, and in most circumstances the tendency will be to identify those forecasts that are particularly crucial to the total planning system, and concentrate effort on these estimates.

The central thrust of these comments is that the need for better forecasting in any policy dimension must be justified, not assumed. Several general elements or requirements should be contained in such analysis: (1) a substantial range of programs and level of fiscal resources should be involved; (2) the availability of generalized models for the type of projections being considered, that is, models that could be modified, replicated, or adapted for use; (3) the existence of and ready access to necessary data and information, presented at the appropriate levels of aggregation, with continuous availability for future years; and (4) an identifiable benefit from the improved forecasts and the initial investment required to obtain them, such as substantially better resource allocation decisions, availability of staff time for other projects, and integration of the forecasts into a total planning system.

For reasons that will be indicated later, the conclusion here is that vocational education as a policy area can well justify greater attention to forecasting efforts, with particular emphasis on manpower and occupational projections. The specific elements of justification noted above, (1) range of programs and

resources, (2) availability of models and methodology, (3) availability of data and information, and (4) recognizable benefit, will be reexamined as part of the discussion of manpower and economic forecasts.

Other forecasts required by the Planning System discussed here include population, client and recipient groups, staff and space requirements, and revenues. Discussion of forecasts in these areas will be brief, recognizing that only a research study directed toward the implementation of the Planning System, and involving personnel of the Division of Vocational Education, can make the required decisions on variables, methodology, and data.

Population and Client and Recipient Groups

Development of population forecasts, including characteristics predicted as being associated with a certain proportion of the total population, is a complicating and exacting task. To date the Division has relied on a number of secondary sources for the overall projections, with data on the characteristics associated with vocational education needs being developed internally. This pattern of activity should continue with some analysis of alternative methods of arriving at the size of potential client and recipient groups.

Total state population projections for any given state will normally be available from a number of sources, both national and those developed by demographic consultants to the state or its individual departments. Much confusion in state and departmental

planning can be eliminated if agreement can be reached for all state agencies, or at least within individual departments, on a single population series. There of course may be circumstances where a division or bureau or department may not be willing to place reliance on the population projections developed by the higher level unit, but these differences should either be worked out in the preparation stages or expressed in terms of a range with high-low estimates.

A few technical points require mention here. Though forecasts, estimates, and projections are being used interchangeably in this discussion, there are, of course, distinctions between these terms in (1) the number of years for which figures are sought, (2) the basis for the figures, and (3) the policy assumptions involved. Some would employ the term forecast only for figures that extend beyond a five year period and which have predictive value, with numbers in the remaining category being termed projections. Further, projections can be distinguished by those that are based on what has occurred in the past and what can be called judgmental projections, that is, projections presented in alternatives illustrative of the carrying out of a set of assumptions.

In all instances, however, someone must make a judgment as to the validity of the numbers obtained, whatever method is employed. It is precisely this judgment that will not be attempted here; such judgments are always premature if not predicated on careful analysis of the methodology and data

employed, neither of which has been possible as part of this design effort.

Returning to the presently available population and client or student forecasts, we find both forecasts and accumulations of past data on which projections can be based. The work of S. David Winans, cited in Commissioner Carl L. Marburger's budget presentation, provides a departmental forecast of population through 1985, with projected enrollments to the fall of 1987-88. The Department of Conservation and Economic Development provides several publications on population questions - age groups, characteristics, estimates, and trends - which, when current, can provide a base for projections incorporating a variety of assumptions about future growth.

The Division of Vocational Education State Plan for Vocational Education Part II - Long Range Program Plan Provisions presents an analysis of population characteristics relating to vocational education needs. Figures are included from the latest available data for 1968, estimates of 1970, and projections of 1974 population figures for general population, school enrollment vocational education enrollment, dropouts, unemployment, nubmers of disadvantaged, handicapped, working women, and private vocational-technical school enrollment. Clearly the figures obtained from the 1970 Census will provide a new base for reconsideration and reforecasts of all demographic variables.

Client and recipient groups (potential students) which the Planning System must forecast, include regular, handicapped

(mental and physical), and disadvantaged (social, illiterate, requiring retraining). Forecasts will also be developed for drop-outs, unemployed, and foreign born. Several publications of the Department of Education, by the Division itself and the Office of Statistical Services, provides base data on which a projection series could be based.

In general, projections based on an assumption that any group will represent a certain proportion of some total future population will provide a base figure. Modifications in this figure will stem from judgments on phenomena related to that group, e.g., a rash of birth defects in a given base year should be reflected in year five of a total state plan for vocational education. The Division's current method of dealing with these projections are indicated in its 1968 publication, "Population Characteristics and Vocational Education Needs". Whether any change in present methods for any of these client groups is required depends in part on their predictive value in the past and the consequences for the total planning system of errors falling outside a certain range of estimates.

Individual studies and reports concerning the dropout pattern (Office of Statistical Services), unemployment and the foreign born are available from reports of Federal and state agencies.

Manpower and Occupational Forecasting in the Vocational Education Setting

Justification. The key assertion here is that manpower forecasts are of such particular relevance for vocational educational planning that considerable attention should be given to such forecasts in the development and implementation of a full planning system for the Division of Vocational Education. This position can be supported using the four requirements that seem relevant in justifying a significant expenditure of effort on forecasting considerations.

First as to resources, passage of the Vocational Education Act of 1963 and the 1968 amendments vastly expanded the program coverage and fiscal support for vocational and occupational training in the United States. Current and prospective funding levels are of sufficient dimensions to merit greater attention to projections of demand (future manpower requirements) and supply (educational and other socio-economic characteristics of the population to be served) aspects of occupational forecasting.

As to the current state of forecasting models, there are a variety of well-developed methodologies for making general manpower projections that will assist in vocational educational planning. Several studies will be reviewed in the following section. Of these, the work of the National Center for Education Statistics of the Department of Health, Education and Welfare toward techniques for projecting vocational education requirements at the state and area level is the most directly

relevant. Even though there may be missing pieces for complete state and regional projections, numerous inquiries can be made to provide usable and transferable models and methodologies.

Availability of data aggregated by state, regional (intra-state), and county units frequently will determine the selection of a model. Data normally will come from other Federal and state government units, since independent data gathering is prohibitively expensive. Major national sources of data will be cited in the material to follow. In formulating a planning system there are two major options with respect to data for forecasts: data availability can be viewed as a constraint resulting, for instance, in neglect of areal dimensions that break across county lines; or the need for different aggregations may be seen as controlling and an effort made to persuade groups gathering statistics to provide the necessary information.

In the context of a state vocational education program there is one dominant identifiable benefit in superior manpower forecasting - that is to enhance the competitive position of the state for economic development. For a highly industrialized state such as New Jersey, failure to anticipate structural unemployment, as explained in Chapter II, could have grave economic consequences. Forecasts of labor shortages will be as crucial to vocational educational efforts as any other aspect of program development.

To turn to some additional substantive justifications for manpower planning, the fact is that vocational-technical

education planning involves elements of both human resource and more traditional educational planning. This relationship is depicted in Chart III-O. If human resource planning is concerned with the economic productivity of individuals and educational planning with the availability and quality of educational services the link is in vocational educational planning. Here goals related to the training of individuals for productive participation in the economy are evaluated in conjunction with the goals of individuals specifically seeking vocational-technical skills. For general educational planning some notion of the future structure of the labor force is appropriate since instructional policy involves some guess concerning the impact of economic developments on employment; for vocational educational planning, however, some fairly definitive estimates of future labor force composition in terms of personnel needed by specific occupational qualifications is required.[1]

Major Methodological Alternatives for Developing State and Area Manpower Projections. Because of the importance attached to manpower forecasts (among the total number of forecasts required by the Planning System), the methodologies employed by several leading manpower studies are here reviewed. In practice, state vocational education divisions are frequently found as sponsors of economic research on manpower problems.

Manpower studies selected and reviewed as representing leading efforts in the field include the following: (1) the four volume study entitled "Tomorrow's Manpower Needs" published by

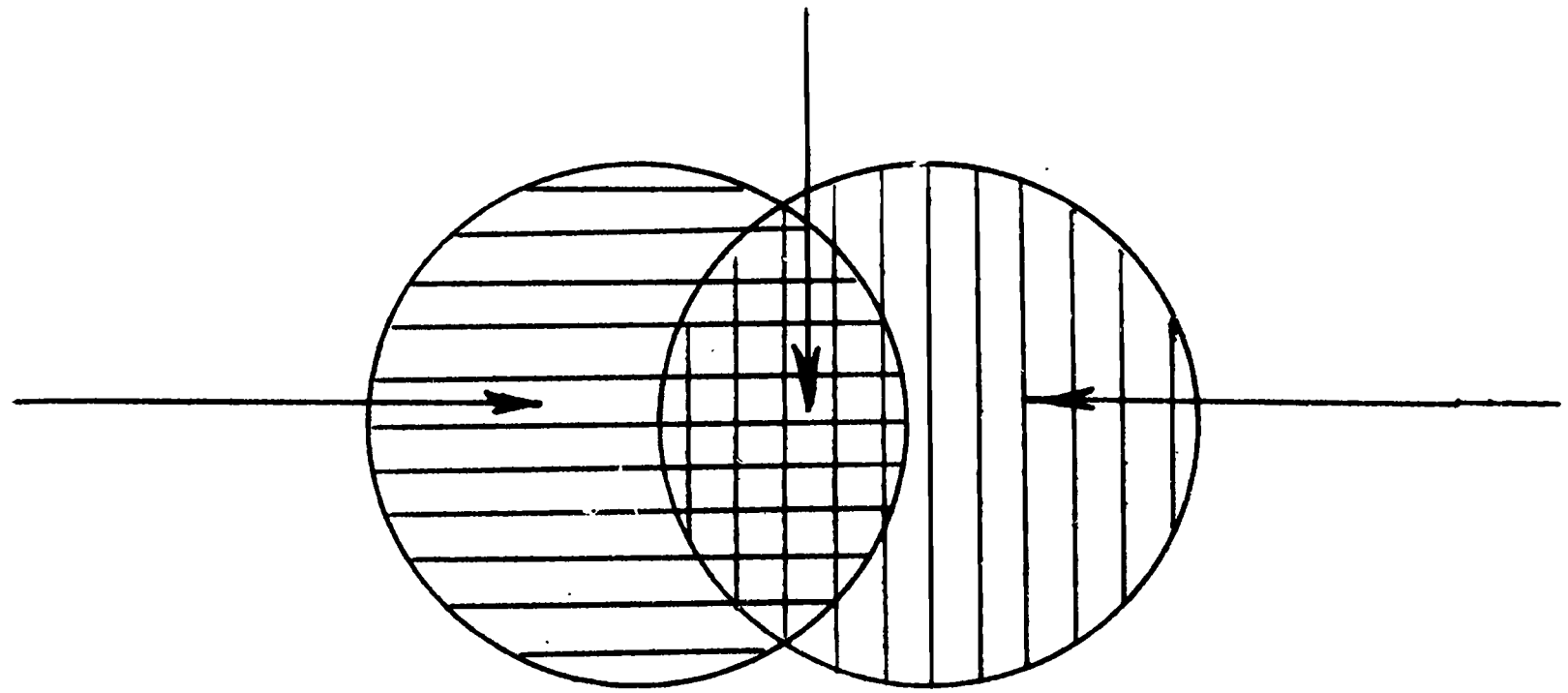
CHART III-Q

MANPOWER PLANNING - A REPRESENTATION*

HUMAN RESOURCE PLANNING

VOCATIONAL EDUCATIONAL PLANNING

GENERAL EDUCATIONAL PLANNING



INDIVIDUAL AND INSTITUTIONAL GOALS FOR MANPOWER UTILIZATION

ALL EDUCATIONAL GOALS INVOLVING NON-VOCATIONAL CONSIDERATIONS

* FROM, MANPOWER FORECASTING IN EDUCATIONAL PLANNING -- ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT.

the U. S. Department of Labor, particularly Volume I - Developing Area Manpower Projections; (2) The Michigan Manpower Study prepared by the Battelle Institute for several Michigan state agencies including the Division of Vocational Education; (3) a report on Vocational Technical and Continuing Education in Pennsylvania with particular reference to Chapter V, "Supply and Demand of Manpower in Pennsylvania"; (4) one of a series of reports on manpower in Pennsylvania prepared by the Bureau of Economic and Business Research of Temple University; (5) reports on forecasts and models in educational planning developed by the Organization for Economic Co-operation and Development, and most relevant (6) a paper entitled "Occupation Education Requirements Analysis" dealing specifically with vocational education requirements at the state level, prepared by the National Center for Educational Statistics of the U. S. Office of Education. What will be attempted is a brief descriptive review of the methodology employed separating the treatment of demand and supply manpower projections.

"Tomorrow's Manpower Needs[2] prepared by the Bureau of Labor Statistics, Department of Labor is the most extensive source available both for national projections on industry employment, occupational structure, occupational employment, and for explaining the use of these national manpower data in arriving at parallel state and area projections. As suggested by its title, Volume I of this series is totally devoted to methodology for projecting both demand and supply aspects of national manpower

data. Framed so as to be of "assistance to analysts in developing State and area manpower projections", projections for industries and for occupations are examined separately. A national industry-occupational matrix is presented with both a verbal and mathematical explanation of two area projection methods and an evaluation of results obtained for each. In particular, "area projection Method A" should be reviewed for possible application of its use of "occupational trend factors in New Jersey".[3] Data employed by these projection methods is available from a variety of Federal sources, principally the other volumes of "Tomorrow's Manpower Needs". Volume I also explains in considerable detail how the national manpower data contained in Volumes II-IV was employed by the New York State Department of Labor to develop overall state and sub-regional projections for that state.

Beyond employment requirements two other aspects of manpower demand discussed in Volume I are (1) replacement needs for those who retire, die, or leave the work force for other reasons and (2) transfers of workers between occupations, with emphasis on the former. For estimating replacement needs the use of separation rates are explained for national data, with a section on "how to develop separation rates for a State or area".[4]

While the bulk of Volume I pertains to future manpower requirements, (that is, the demand side of the equation), a separate chapter is given over to "Appraising the Adequacy of Supply in Individual Occupations". Examples used here

predominantly relate to professional-technical personnel; however an equation is presented (the model uses estimates of inflow and outflow to reach an estimate of supply needs for the future) which could have general vocational application. The Volume concludes with some state and regional projections of population and labor force which draw on the monthly labor force projections published by the Department of Labor. The other volumes represent a valuable source of compatible data. (The "Preface" to Volume I indicates that these volumes may best be used in conjunction with the "Handbook for Projecting Employment by Occupation for States and Major Areas" which provides detailed operating instructions for State employment agencies as developed by the Bureau of Employment Security of the Department of Labor.)

The Michigan Manpower Study[5] conducted by the Battelle Institute focuses on a state government with participation by that State's Division of Vocational Education. The Battelle Institute "Socio-Economic Labor-Force Model", though presented as a form of revealed word with relatively complex matrices of labor force projections, employs techniques familiar to manpower exonomists; the approach involves a reconciliation of supply and demand factors with a mild innovation in the use of "educational attainment" as an equating" variable. The three major steps in the Michigan labor force analysis were these:

1. "A detailed projection of future demand for employees by occupation, by industry, yielding, for example, estimates of the future demand for professional and

technical employees, clerical employees, etc.; for employees with a college education, with a high school education, etc. and for employees of all types in manufacturing, communications, transportation, etc."

2. "A detailed projection of the future level of educational attainment of the population, by age and sex, and derivations from this projection the future levels of educational attainment of the labor force."
3. "A reconciliation of the projected demand for and the supply of terms of educational attainment, yielding a profile of future employment by occupation and educational attainment."[6]

Several qualifying statements indicate certain gross characteristics of the model. A primary limitation for vocational educational concerns is acknowledged in stating that the "skill-acquisition process involves many dimensions in addition to formal educational attainment". The future demand mentioned in (1) above does not include requirements resulting from interstate mobility, movement between occupations and industries, death, retirement, or other wirhdrawal from the labor force.

The major inputs for the Battelle model were, <u>for the supply analysis</u>, "(1) A projected population distribution by age and sex, (2) Projected educational attainment for the popualtion of labor-force age, (3) Labor-force participation rates for each age group by level of educational attainment"[7] and, <u>for the demand</u>

analysis, "(1) Projected total employment for each industry sector, (2) Projected distribution of occupations within each sector, (3) Projected educational attainment which will be required by each occupation."[8] The population projections employed in the model were obtained from an independent source.

National economic trends and projections, as with the four volume Department of Labor study already reviewed, underly the industrial employment and occupational requirements developed by Battelle. The industry employment levels emerged from an analysis of the relationship of primary Michigan industries and the total United States economy projected to 1975; occupational projections were made by obtaining a special reading of the 1960 structure in Michigan and estimating forward on the basis of national trends modified for some major anticipated organizational and technological changes.

The Pennsylvania Vocational Technical Systems Study[9] recognized an absolute requirement for investigating the "occupational education supply and demand in the Commonwealth"; however definite problems were evidently encountered in meshing the total annual supply with annual manpower demand to obtain the unmet needs or "gap". As stated in the Study, "the fact that no single acceptable methodology existed or that attempts made were severely criticized did not diminish the need for a fairly reliable statistical base of manpower supply and demand upon which to evaluate and plan vocational education programs".[10] The need for a reliable "base case" in the area of manpower is

undeniable, but the absence of a "single acceptable methodology" is neither surprising or disturbing. Competent economists and social scientists continue to differ on methodologies, though agreeing in principle that what is "acceptable" depends on the use and reliance to be put on the projections obtained.

The methodology employed in the Pennsylvania study was extracted from "Tomorrow's Manpower Needs" and is explained in two pages and in Table 97 which presents "Pennsylvania Manpower and Training Data" (though a more detailed explanation is available through the Pennsylvania Research Coordinating Unit for Vocational Education).[11] The procedure relies on the occupational matrix construct recommended in the Department of Labor and involves "multiplying the 1960 State percentage distribution of selected occupations (Census) by the pattern of national change factor to develop the 1975 percentage of occupational density and then applying this percentage, modified in light of the Pennsylvania situation, to projected total employment in Pennsylvania in 1975." This certainly constitutes an acceptable procedure for statistical projections without the burden of an extensive survey of employers; obtaining the base data is, as the Study claims, "a breakthrough of considerable significance". With the 1970 Census figures and further updating of data gathered more reliable estimates can be obtained.

Most of Chapter V is given over to the presentation of the data obtained in the Pennsylvania survey, primarily (1) the distribution and percent of 1967 graduates from nine major

training institutions or agencies over eight occupational categories (and various matrices using absolute numbers and percentages of this data), (2) the number and percent of 1967 graduates of occupational education training institutions by counties, and (3) the number and percent of 1967 occupational education graduates by occupational categories in each county.

In the last several years the Bureau of Economic and Business Research, The Harry A. Cochran Research Center attached to the School of Business Administration of Temple University in Philadelphia has done extensive work on human resource and manpower projections. One set of volumes entitled Manpower in Pennsylvania produced a set of labor force and manpower figures for every Pennsylvania county for the years 1940-1963, with mathematical trend projections to 1980.[12] The following were data series developed:

1. Labor force by age, sex, race, by residence employment, by residence
2. Employment by industry, by residence and establishment
3. Employment by occupation, by residence

One of the main uses noted for the extensive data produced was in "planning of educational facilities and programs". The "summary" of the volume on methodology should be reviewed.[13]

Another significant study by the Temple Bureau of Economic Research was "A Manual for the Development of Estimates of Future Manpower Requirements for Training Purposes".[14] As evaluated by the Bureau of Labor Statistics of the U. S. Department of Labor,

this publication lays out a "step-by-step approach to projecting long-run industry and occupation requirements...".[15] Local industrial employment is analyzed to determine whether the employment levels are primarily responsive to national, state, or sub-regional economic factors. Again the method for projecting occupational employment relies essentially on national trends, but with particular emphasis on the importance of taking cognizance of local conditions so as to introduce appropriate modifications for smaller areas.

The Organization for Economic Co-Operation and Development (OECD) presents in two volumes, quantitative mathematical models employed by several foreign educational agencies.[16] A planning model for educational requirements associated with economic development is evaluated and appraised in the first volume. The second volume, dealing with mathematical models contains an interesting but difficult paper, entitled "Training Policies under Conditions of Technical Progress: A Theoretical Treatment". Developing direct applications for vocational education from these models would be a relatively complex task, however, and reliance should be placed on methodologies already developed and adapted to a state vocational education setting.

Manpower Forecasting in Educational Planning,[17] cited previously, presents the experience in the use of various manpower planning techniques employed in a number of the twenty-two countries that make up the Organization for Economic Co-operation and Development. This volume also contains an

extremely valuable essay by the rapporteur, Herbert S. Parnes of Ohio State University.

The Occupation Education Requirements Analysis (OERA) system is the single most useful source of labor force and manpower projections in that it was specifically designed for vocational education. The OERA is described in a technical paper prepared by the National Center for Educational Statistics of the U. S. Office of Education.[18] A system for producing annual projections of employment in occupations classified by vocational education programs, the OERA is the most relevant methodological source found during our search of the literature. Cited and briefly described in Tomorrow's Manpower Needs, a full copy of the report was obtained from the National Center for Educational Statistics.[19] A request for further information on the OERA brought an indication that "...organizational changes have precluded our further development of models pertaining to supply or demand projections".[20]

Nevertheless the OERA merits the consideration and evaluation of New Jersey vocational personnel. As a method for forecasting the labor force in terms of educational requirements, with the final output being "annual projections of employment demands in occupations classified by vocational education programs", the OERA could be a valuable forecasting technique. The computer capacity required would seem to be well within the Division's capabilities. Though only briefly described here because of the relative complexity, possible adaption and further

development of the models from the point that the Office of Education carried them could be part of the implementation effort.

The Division's Manpower Projections and Publications. Plan for Vocational Education (P.L. 90-576), Part II deals with Long Range Program Plan Provisions with analysis of manpower needs and job opportunities in New Jersey. Table I presents Employment Opportunities related to vocational education programs with labor demand and labor supply (including voc ed output and other sector output) projected to 1974. The vocational educational programs are the seven categories of agriculture, distribution and marketing, health, home economics, office occupations, technical training, and trades and industry.

A considerable range of publications by the Division and other New Jersey state agencies were reviewed which provide present data that could be of considerable value in undertaking more involved occupational forecasts. The Department of Labor and Industry, Division of Employment Security published periodic Manpower Projections (the most recent to 1975), Area Trends in Employment, and Labor Area Profiles. The Department of Conservation and Economic Development's Division of Economic Development publishes selected economic data by counties with population breakdowns by major municipalities, and periodic major summaries of employment characteristics, labor force, and occupations.

An extremely valuable discussion of industrial growth and manpower requirements for the State is contained in a section of the final report of the Facilities Committee of the Master Plan group. Labor market trends and occupational shifts, employment growth and shifts, and regional growth are summarized primarily from economic base studies conducted by the Regional Plan Association, the Port of New York Authority, and the U. S. Bureau of Labor Statistics.

In summary, based both on the major manpower studies reviewed and the efforts of the State of New Jersey, some critical unmet methodological problems can be identified. Those who reject sophisticated projection attempts normally do so not because the forecasts are not relevant, but because they are viewed as difficult if not impossible. These are among the most difficult forecasting problems:

-Estimating productivity changes based either on technological shifts or changes in organization structure of key Census industries.

-Assuming that occupational profiles are similar from one geographic area to another, and that such profiles are representative of manpower requirements given technological and organizational structure changes.

-Determining educational qualifications associated with both aggregate and specific occupational categories.

-Predicting the occupational and geographic mobility of persons in the state labor force.

These are key problems to be considered if effective forecasting of employment and occupational requirements is to be undertaken. However, the obvious difficulty in treating such issues should not imply that the goal is relative certainty concerning the labor force structure some ten or fifteen years hence. Unconditional predictions are of course impossible, there are no pretensions of certainty. But some definite indications concerning employment requirements can be framed in terms of certain economic growth goals, without elaborate and expensive efforts. Manpower projections which anticipate the occupational composition of the work force required for achieving various economic goals is a vitally important foreacast for a vocational educational program.

Staff and Space Requirements

In the overall planning diagram, reference is made to staff available forecast and space inventory files. Projections in these areas are regarded as being within the purview and particular competence of Division personnel; they would not seem to require any highly formalized projection techniques or the investment of resources required to generate elaborate models.

Staff available, in the context of the planning system, may be restricted to administrative and instructional personnel required for implementing particular vocational education programs. Thus forecasts of staff available for all activities under all revenue sources will normally operate as a constraint

on programs and projects both in the base case and in the alternative sets considered. Factors considered will be the familiar items associated with staffing any program operation - specialized talent currently available within the state of New Jersey, potential staff being produced by educational and training programs of the State, and some factor that expresses the net gain or loss from migration of such personnel. Where instructional or other personnel essential to a future program under one revenue source requires teacher training to fill gaps in manpower available, this manpower requirement should be considered as fundable from the entire range of revenue sources and programs.

Forecasts on staff availability thus require assessment of factors that those acquainted with specific revenue sources and programs will be best equipped to make. In implementing the Planning System attention would be given to some limited formalization of the techniques now employed by Division officials and to more extensive data gathering on those factors which Division officials feel are most relevant to staff available forecasts.

However, it should be recognized that implicit in such forecasts are a number of professional education standards about staff/teacher utilization. Staff indicators are a part of both the base case and alternative sets. Such standards must be scrutinized as part of the forecast process to be certain that

relatively arbitrary application does not result in the curtailment of otherwise valuable programs.

With reference to the space inventory file for a single revenue source and the space available for all activities under all revenue sources, the point has been made before that facilities constructed under one source may be used for instructional activities funded by another source. Thus the assumed interrelationship, and the sequence of review. When planning for the facility and space requirements of one revenue source it may be crucial that facilities erected through other revenue (or even private) sources in the same geographic area are underutilized. The logic here would suggest that some construction planning might well break over county lines.

Again professional standards such as space required per student for various instructional programs will be a consideration. However the key consideration is that the facilities provided (total space inventory) should be sufficient to house the total programs funded by the Division.

An example of an entirely appropriate technique for space projections is the portion of the Plan for Action (prepared by Division personnel) dealing with faciliites. The objective is to provide instructional facilities to meet the needs of "fifty percent of the secondary enrollment and the needs of adult and teacher education programs". A chart is developed which presents the "1980 Projected Facility Needs for Vocational Education".

In general, projections of space needs will not require complex forecasting procedures. One key factor which should be considered, however, is the present utilization of existing space; specific space indicators also are reviewed as part of the base case and alternative sets for each revenue source.

Federal and State Revenue Forecasts

The level of Federal funding under grants-in-aid, the educational areas to be serviced, and the probable allocation for New Jersey given the existing grant authorizations are all of critical importance in vocational education. Forecasting over years covered by existing Federal authorizations involves reliance on allocation formulas (such as those in P.L. 90-576) and past experience with appropriations received. In the absence of Federally prepared multi-year spending projections on a state-by-state basis, the only information available to a state is the extent of Congressional authorizations, past appropriations, and the experience with allotments. Beyond the period covered by Congressional authorizations the judgments on the magnitude of Federal support become problematic. Here state estimates are only as reliable as the Federal officials or communications that serve as the sources of information on which the forecasts are based. Forecasting models and fiscal planning are not compatible with annual appropriations. In dealing with Federal funding sources the ever present question is how well one can predict the future from the past.

Equally difficult is any attempt to forecast changes in the Federal allocation formulas or other legal requirements which acts as a constraint on revenue allocations. Only explicit guidance from Federal agencies and officials should be used in such forecasts.

As to state revenues, projections are required for both the Division budget and for the magnitude of State grant-in-aid funds. Such "projections" are only indirectly related to the extensive economic literature on forecasts of the total revenues which will be available to a state in future years. Such "projections" are in effect guesses about the share of the total New Jersey and Department of Education budgets which the Division of Vocational Education will receive. Such projections become even more tenuous when the multi-year period over which they are made include elections for Governor or the state legislature.

Given the incremental nature of most state budgeting, the normal assumption is for an increase near the midpoint of the range in percentage growth of the Division budget over the previous four to five year period. But any such crude estimate would be modified by the informed judgment of Division officials concerning the political factors operating; such judgments can be quite accurate for one and even two years ahead, but steadily deteriorate beyond that period.

Perhaps the best procedure for estimating both Federal and state revenue sources is to set up a process, ideally computerized though possibly manual, to develop and continuously

update figures on prospective revenues. These rough estimates would extend over several years using past trends and current information on program plans. Setting up such a projection process with the attendant analysis of revenue receipts, frequently leads to the discovery of other bases for making projections.

FOOTNOTES
CHAPTER III

[1]For an excellent elaboration of these points, see H. Parnes, Manpower Forecasting in Educational Planning, Organization for Economic Cooperation and Development, Paris, December, 1965.

[2]Tomorrow's Manpower Needs: National manpower projections and a guide to their use as a tool in developing State and are manpower projections. Bulletin No. 1606: U.S. Department of Labor, Bureau of Labor Statistics.

Volume I - Developing Area Manpower Projections
Volume II - National Trends and Outlook: Industry Employment and Occupational Structure
Volume III - National Trends and Outlook: Occupational Employment
Volume IV - The National Industry-Occupational Matrix and Other Manpower Data

[3]Ibid, Volume I, pp. 10-11.

[4]Ibid, Volume I, pp. 52-55.

[5]The Michigan Manpower Study: An Analysis of the Characteristics of Michigan's Labor Force in the Next 15 Years. Prepared by the Battelle Memorial Institute, Columbus, Ohio, November, 1966.

[6]Ibid, p. 4.

[7]Ibid, p. 5.

[8]Ibid, p. 17.

[9]Vocational Technical and Continuing Education in Pennsylvania: A Systems Approach to State-Local Program Planning. A Report to the Department of Public Instruction and the Pennsylvania State Board of Education by Walter M. Arnold, Consultant, 1969, particularly Section II - Economic Trends and Manpower Projections, Chapter V - Supply and Demand of Manpower in Pennsylvania, pp. 160-199.

[10]Ibid, p. 192.

[11]Ibid, pp. 194-195, et. seq.

[12]Manpower in Pennsylvania, prepared by Louis T. Harms and Rosella James, School of Business Administration, Temple University, for the Department of Community Affairs, Commonwealth of Pennsylvania. (Harrisburg, Penna.: 1967).
Volume One - Methodological Statement
Volume Two - 1940-1963, Projections to 1980.

[13]Ibid, Volume I, pp. 1-13.

[14]A Manual for the Development of Estimates of Future Manpower Requirements for Training Purposes, prepared by the Bureau of Economic and Business Research, Temple University, for the Office of Manpower Policy, Evaluation, and Research, U.S. Department of Labor, March, 1966.

[15]Tomorrow's Manpower Needs, Volume I, p. 45.

[16]Econometric Models of Education: some applications, papers by Jan Tinbergen and H. C. Bos, Organization for Economic Cooperation and Development, (Paris: 1965); Mathematical Models in Educational Planning, a series of papers published by the Organization for Economic Cooperation and Development, (Paris: 1967).

[17]H. Parnes, Manpower Forecasting, op. cit.

[18]William C. Morsch and Jeanne Grist, Occupation Education Requirements Analysis, Division of Operations Analysis, National Center for Educational Statistics, Office of Education, U.S. Department of Health, Education, and Welfare. Technical Note Number 47 dated December 12, 1967.

[19]Tomorrow's Manpower Needs, Volume I, p. 46.

[20]Personal letter dated December 8, 1969 from Mr. Ezra Glazer, Acting Director, Division of Statistical Information and Studies, National Center for Educational Statistics, Office of Education, Department of Health, Education, and Welfare.

CHAPTER IV

GENERAL DESIGN AND LOGIC OF THE PLANNING SYSTEM

Preliminary Considerations

The general design of the planning system assumes that the planning for each revenue source must be done within the context of the commitments made by the Division for all other revenue sources under its control. At the present time, the Division has varying degrees of control over sources of revenue and numerous non-continuing sources. The planning cycles of the non-continuing sources are intermittent throughout the 15 month Division Planning Cycle. The continuing sources of revenue have planning cycles that take place during specified periods within the Division's Planning Cycle. These individual planning cycles are shown on Chart IV-A. The present staging of the planning cycles of the eight continuing revenue sources over the 15 month period is generally amenable to the development and testing of the comprehensive long-range Planning System for the Division. Two sources -- Civil Defense Education Act of 1950 and Veterans Administration -- pose minor difficulties because their planning cycles conclude before the planning cycles of the preceding revenue source.

CHART IX A

TIMING OF THE 1973-74 DIVISION PLANNING CYCLE (FY73-75) FOR ALL CONTINUING REVENUE SOURCES

(TIMING OF NON-CONTINUOUS REVENUE SOURCE PLANNING CYCLES ARE VARIABLE)

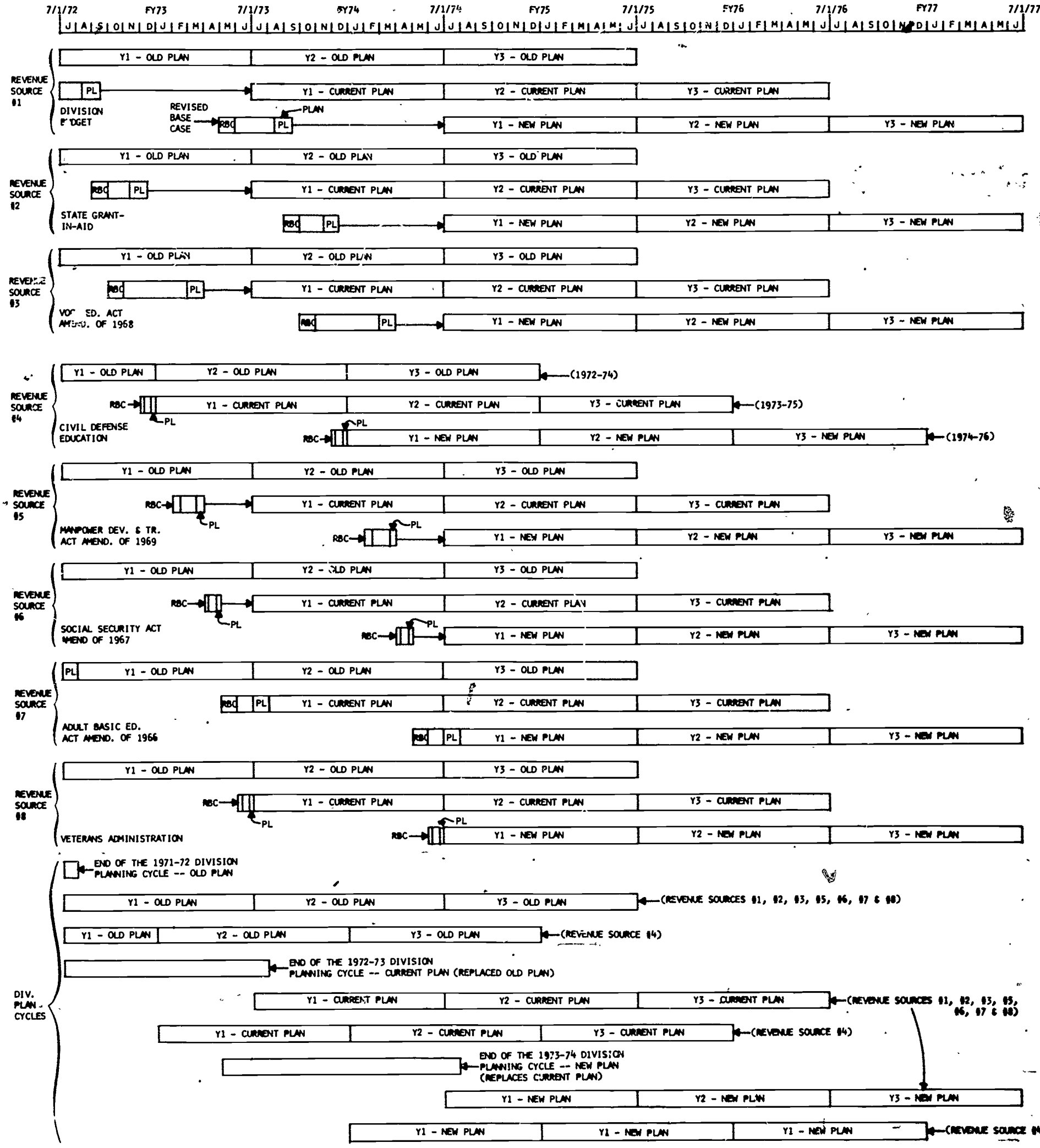


Chart IV-A shows the overlapping problem that the Division currently faces with respect to three separate planning cycles that yield three separate plans (Old, Current and New) over a span of approximately six years and two months. For convenience sake, planning horizons shown on the Chart have been limited to three years, though a planning horizon of five years will be used in the proposed Planning System. The planning period shown on the chart covers the period from Fiscal Year 1973 (FY73) through Fiscal Year 1977 (FY77).

The Old Plan shown on the chart was produced during the 1971-72 Division Planning Cycle. The Current Plan was produced during the 1972-73 Cycle and the New Plan during the 1973-74 Cycle. Each plan grows out of the previous plan. At the end of each planning cycle for each revenue source and at the end of the Division Planning Cycle a plan document is produced and, where necessary, an annual budget document. The 1973-74 Division Planning Cycle begins with the cycling of the Division Budget Planning. At the time this process begins the Division is currently operating on the first year of the Old Plan. Before the Division Budget Planning Cycle is completed the Division has moved into the first year of the Current Plan for the entire Division. Because the Civil Defense Education Revenue Source is planned on a calendar year rather than a fiscal year and because the Adult Basic Education Revenue Source Planning Cycle is not completed until July of FY75, the Division completes operation on the first year of the Current Plan and begins working on the

first year of the New Plan. The New Plan is the plan that is being developed during the 1973-74 Division Planning Cycle. This overlapping problem, while not serious, must be taken into consideration in the detailed design and testing of the Planning System.

As pointed out in Chapter III, the Base Case Phase and Alternate Set Phase of a given revenue source planning cycle will require information on the Current Plan or New Plan of the other revenue sources. Whether the information is drawn from the Current Plan or the New Plan depends on when, within the Division's Planning Cycle, this information is needed. The information requirements of each revenue source during its planning cycle are discussed in Chapter III.

Major Components of the System

The Vocational Education Planning System is subdivided into four components: (1) Division and Revenue Source Planning Subsystem Procedures, (2) Division and Revenue Source Indicator Sets, (3) Forecast Procedures, and (4) Data and Information Files and Report Generation Procedures. Each of these components serves as an integral and indispensable component of the total Planning System. Chart IV-B illustrates the general flow of the Vocational Education Planning System, showing the components of the System and their relationships with each other. The

procedures described for Revenue Source 1 will be the same for the other eight continuing revenue sources.

Planning Subsystems

Each revenue source requires a separate planning subsystem. An illustration of these subsystems is represented on the chart by the boxes labelled "Revenue Source 1". Each subsystem consists of a series of sequential procedures, some of which are manual and some of which are automated. A similar set of procedures is required for the Division's Planning Subsystem. These procedures are represented by the boxes that are labelled "All Revenue Sources".

Indicator Sets

A set of Social Demand, Process and Output Indicators is required for every revenue source. A general set is also needed for the Division. While separate boxes have not been provided on the chart to represent these sets, the use of the General Indicator Set and the Revenue Source 1 Indicator Set is implied in the boxes that represent those procedures concerned with Revised Base Case, Base Case Evaluation, re-examination of Policy Decisions, development of the Alternative Set, and Alternative Set Evaluation.

Forecast Procedures

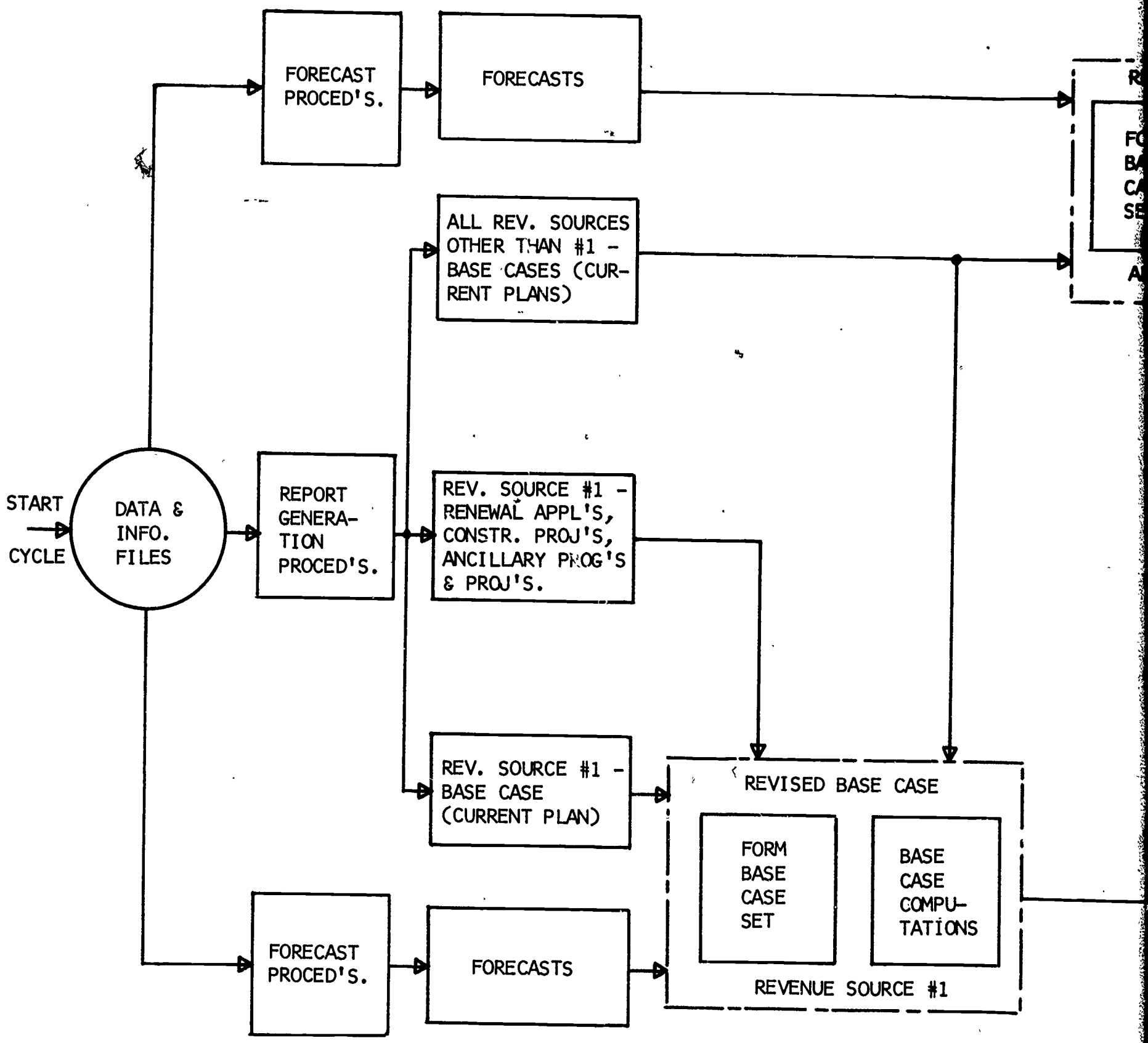
As is indicated in Chapter III, a series of forecast procedures is also required. These procedures are concerned with the forecast of population, client groups, manpower requirements, staff availability, space availability, and anticipated State and Federal revenue. These procedures are represented on Chart IV-B by the boxes marked "Forecasts".

Data and Information Files and Report Generation Procedures

Files are required for each revenue source and a general set of files is also required for the division. Formalized, sequential procedures, both automated and manual, are needed for generating various types of reports to be used throughout the planning cycles of each of the revenue sources. These reports will provide an excellent means of responding to requests for information regarding activities conducted by the Division. The Data and Information Files and Report Generation Procedures are also shown on Chart IV-B.

General Flow of the System

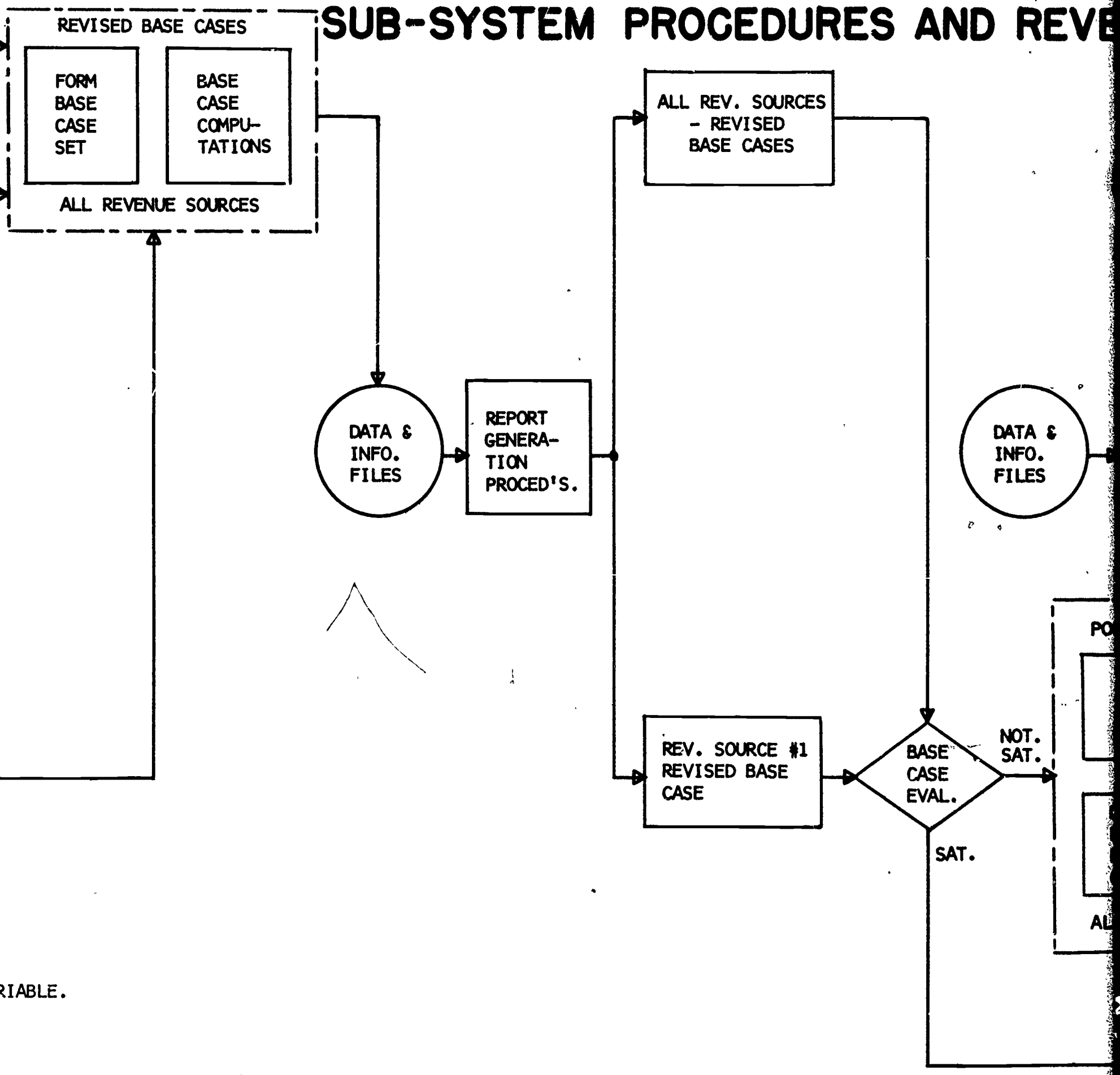
In Chart IV-B, the general flow of the system is divided into two phases -- Base Case Phase and Alternative Set Phase. Each phase consists of a series of formalized, sequential procedures which will be briefly explained in this section. A



NOTE: NON-CONTINUOUS REVENUE SOURCE PLANNING CYCLES ARE VARIABLE.

CH

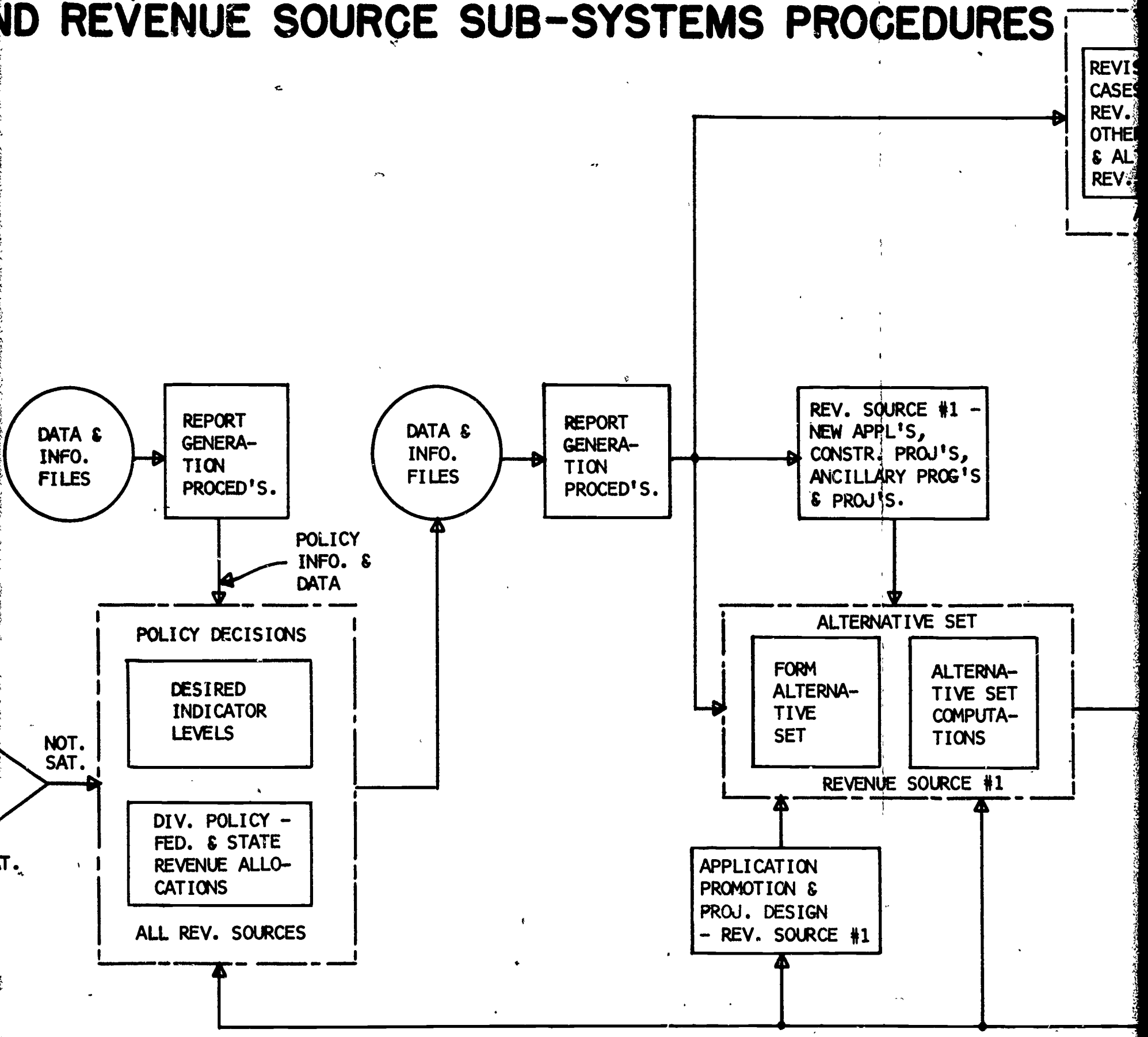
DIVISION PLANNING CYCLE FOR ALL
THE RELATIONSHIPS AMONG THE D
GENERATION PROCEDURES, FOREC
SUB-SYSTEM PROCEDURES AND REVE

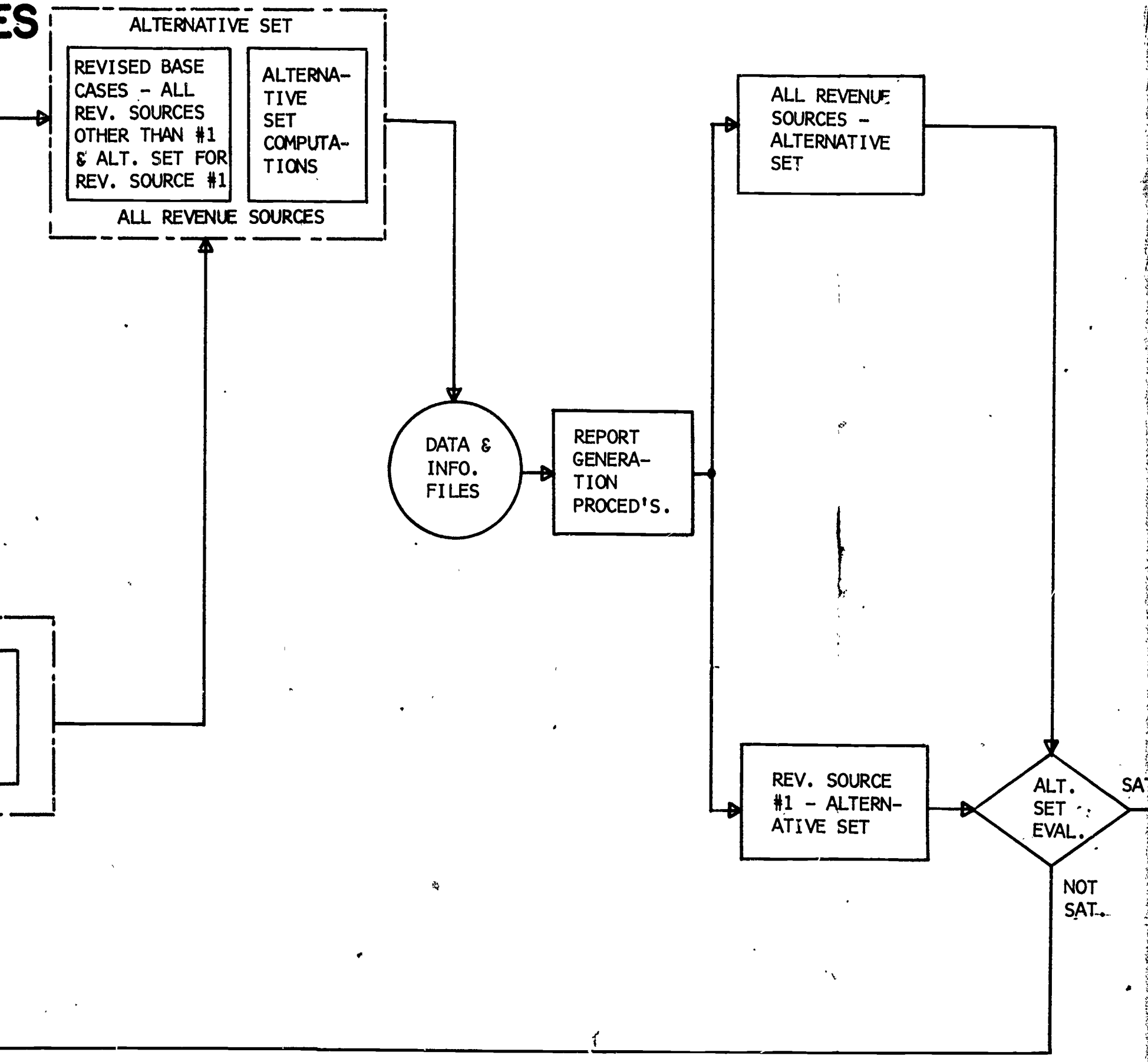


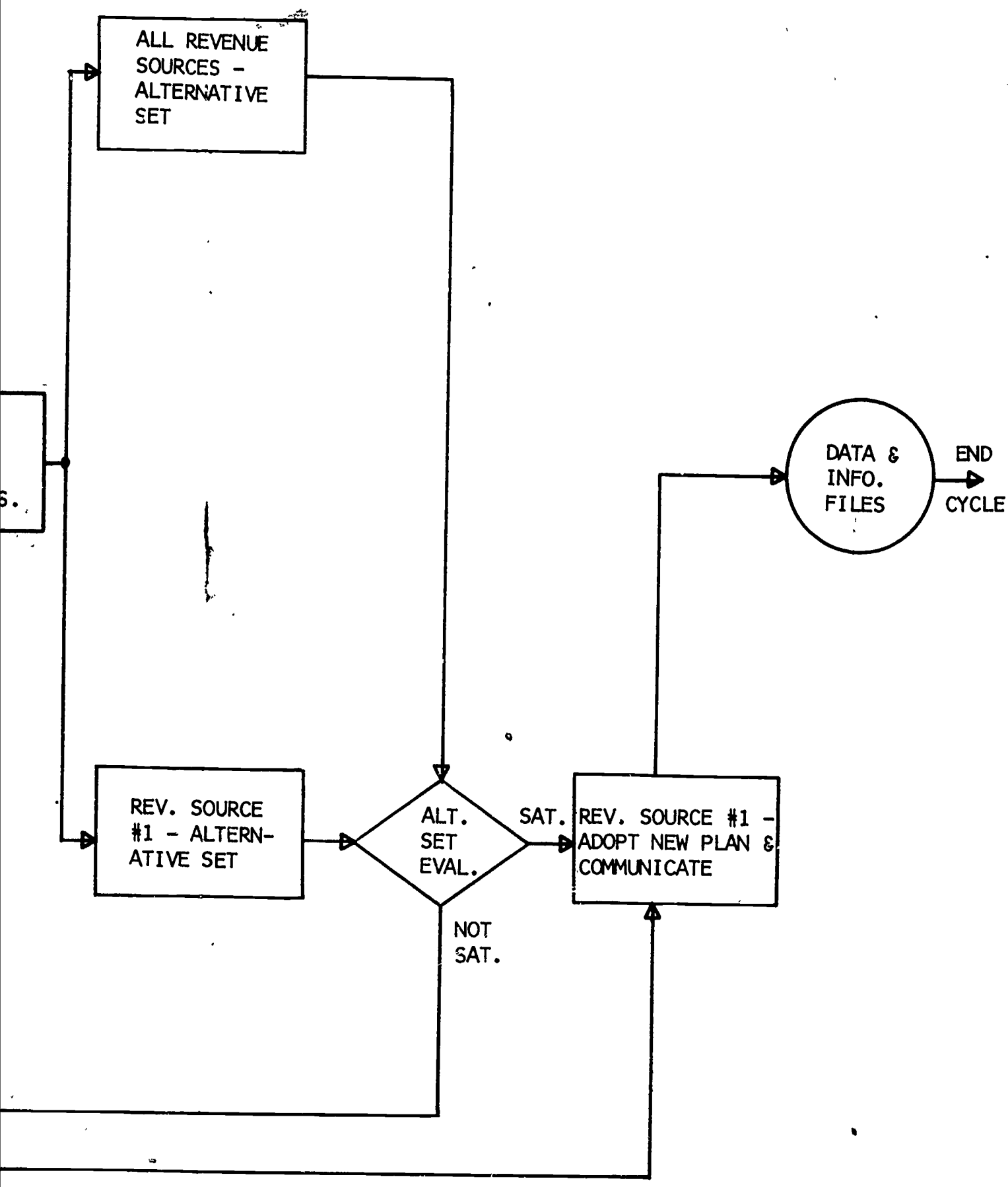
RIABLE.

CHART IV B

OR ALL CONTINUING REVENUE SOURCES SHOWING
G THE DATA AND INFORMATION FILES, REPORT
, FORECAST PROCEDURES, DIVISION PLANNING
ND REVENUE SOURCE SUB-SYSTEMS PROCEDURES




ES
ALTERNATIVE SET
REVISED BASE CASES - ALL REV. SOURCES OTHER THAN #1 & ALT. SET FOR REV. SOURCE #1
ALTERNA-TIVE SET COMPUTA-TIONS
ALL REVENUE SOURCES
DATA & INFO. FILES
REPORT GENERA-TION PROCED'S.
ALL REVENUE SOURCES - ALTERNATIVE SET
REV. SOURCE #1 - ALTERN-ATIVE SET
ALT. SET EVAL.
SAT
NOT SAT.


ALL REVENUE SOURCES - ALTERNATIVE SET
REV. SOURCE #1 - ALTERN-ATIVE SET
ALT. SET EVAL.
SAT.
NOT SAT.
REV. SOURCE #1 - ADOPT NEW PLAN & COMMUNICATE
DATA & INFO. FILES
END CYCLE

more detailed explanation of the Revenue Source Planning Subsystem Procedures will be contained in the following section.

Base Case Phase

Forecasts are developed which provide information to the Revised Base Cases. Status reports on Revenue Source 1's Base Case or Current Plan also provide information to the Revised Base Case Process. These reports contain the results of evaluating previously approved programs and projects, including current indicator levels, and other information needed in the Revised Base Case Process. Data and information are also obtained on renewal applications for local education agency (LEA) instructional programs and previously approved LEA and State construction projects and ancillary programs and projects. Also, data and information, such as the number of students expected to enter activities under all revenue sources other than Revenue Source 1, are extracted from the current or new plans of all other revenue sources and provided to the Revised Base Case Process for Revenue Source 1.

Expenditures and the expected level of indicators are computed for all renewal applications and previously approved programs and projects in the Revised Base Case Process under the assumption that the present level of funding will continue. State and Federal revenue deficits or surpluses are also computed along with the extent to which Federal constraints are met. Finally, for the indicator gaps, the difference between desired

and expected levels are computed for Revenue Source 1. These computations are made, where appropriate, by activity type, bureau, revenue source and total Division and by LEA and area characteristics.

The results of the Revised Base Case Process for Revenue Source 1 provide information for the Revised Base Case Process for all other revenue sources. The forecast and base cases (current plans) or new plans also provide information and data for the Revised Base Case Process for all revenue sources. Minor adjustments are made to the base cases (current plans) or new plans of all revenue sources other than Revenue Source 1. Indicator gaps and the extent of compliance with Division policy concerning Federal or State revenues are computed, where appropriate, by activity type, bureau, revenue source, and total Division and by LEA and area characteristics.

The results of the Revised Base Case Process for Revenue Source 1 and all other revenue sources are placed in the Data and Information Files. The Report Generation Procedures extract from these files the data and information necessary to develop two types of reports. The first type is a Revised Base Case Report of Revenue Source 1. The second type displays results for all revenue sources other than Revenue Source 1 and a summary report of all revenue sources. Each of these reports displays information concerning expenditures, revenue deficits or surpluses, extent to which Federal constraints are met, extent of compliance with Division policy, expected and desired indicator

levels and indicator gaps by activity type, bureau, revenue source and total Division and by LEA and area characteristics. The Assistant Commissioner for Vocational Education and his staff evaluate these reports. The purpose of this evaluation is to determine whether or not to accept the Revised Base Case for Revenue Source 1 as the New Plan. This evaluation is performed within the context of the revised base cases (current plans) or new plans of all other revenue sources. If the Revised Base Case for Revenue Source 1 is found to be satisfactory, that is, (1) indicator gaps are being closed, (2) revenue deficits or surpluses don't exist, (3) federal constraints are met, and (4) Division policy is satisfied, then the Revised Base Case becomes the New Plan and passes through whatever additional approval procedures are required. The results are communicated to the appropriate State and Federal agencies and the LEA's. This decision process takes place eight times during the Division's Planning Cycle. These periods are designated on Table IV-A opposite the lines marked "Base Case".

If the Revised Base Case is unsatisfactory, the Assistant Commissioner and his staff may review the desired indicator levels. Division policy concerning Federal and State revenue may also be examined. If changes are made in the desired indicator levels and Division policy, these changes are incorporated in the Data and Information Files.

Alternative Set Phase

Results of the Revised Base Case evaluations are communicated to the planning staff for Revenue Source 1 to assist them in the Alternative Set Process for Revenue Source 1. Data and information is extracted from the new applications for LEA instruction programs, LEA and State construction projects, LEA and State ancillary programs and projects, for use during the Alternative Set Process for Revenue Source 1. An Alternative Set of old and new LEA applications for instructional programs, old and new LEA and State construction projects, and old and new LEA and State ancillary programs is selected. Expenditures, expected indicator levels, indicator gaps, revenue deficits or surpluses, extent to which Federal constraints are met, and extent of compliance with Division policy are determined. The computations are made, where appropriate, by activity type, bureau, revenue source and total Division and by LEA and area characteristics.

The results of these computations form input to the Alternative Set computations for all revenue sources. The results of the Revised Base Case computations for all revenue sources also provide input to the Alternative Set Process for all revenue sources.

The results of the Alternative Set Processes for Revenue Source 1 and the Alternative Set Process for all revenue sources are placed in the Data and Information Files. The Report Generation Procedures produce the same reports discussed previously. The Assistant Commissioner and his staff evaluate

the Alternative Set or Revenue Source 1 in terms of (1) the indicator gaps, (2) revenue surpluses or deficits, (3) federal constraints, and (4) Division policy. This evaluation is performed in the context of the total commitments of the Division. If the Alternative Set for Revenue Source 1 is found to be acceptable, a New Plan and an annual budget, where required, is developed and communicated to the appropriate State and Federal agencies for final approval. The results of this approval are then communicated to the LEA's and State agencies affected by the New Plan. The Plan is then stored in the Data and Information Files.

If the Alternative Set is not satisfactory, the Assistant Commissioner and his staff have three options: (1) they may call for another Alternative Set, (2) they may promote additional applications and requests that new projects be designed, or (3) they may re-examine and change desired indicator levels and Division policy concerning Federal and State revenues. This process continues until an acceptable New Plan for Revenue Source 1 has been developed. The periods during the Division Planning Cycle when this decision process takes place are shown on Table IV-A for each revenue source.

This basic flow will be followed with minor variations for each revenue source planning cycle. Note at the beginning and end of each revenue source planning cycle a complete set of revised base cases or plans exists for the total Division.

TABLE IV-A

DECISION PERIODS FOR ALL CONTINUING REVENUE SOURCES DURING THE DIVISION PLANNING CYCLE

REVENUE SOURCE	PHASE OF PLANNING CYCLE	FIFTEEN MONTH PLANNING CYCLE														
		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
1. DIVISION BUDGET	BASE CASE	1-31												1-31[3]		
	ALT. SET				15-31	1-15										
2. STATE GRANT-IN-AID	BASE CASE					1-30		15-30	1-15							
	ALT. SET															
3. VOC. ED. ACT AMEND OF 1968	BASE CASE						1-31									
	ALT. SET											1-31				
4. CIVIL DEFENSE ED. ACT OF 1950	BASE CASE								1-10							
	ALT. SET								22-31							
5. MANPOWER DEV. & TR. ACT AMEND. OF 1969	BASE CASE										1-15					
	ALT. SET											16-31				
6. SOCIAL SECURITY ACT AMEND OF 1967	BASE CASE												1-10			
	ALT. SET												21-30			
7. ADULT BASIC ED ACT AMEND OF 1966	BASE CASE	1-31[2]												1-31		
	ALT. SET			1-31[2]												1-31
8. VETERANS ADMIN.	BASE CASE		1-10[2]												1-10	
	ALT. SET		21-30[2]												21-30	

[1] NON-CONTINUING REVENUE SOURCE PLANNING CYCLES ARE VARIABLE.

[2] THE PREVIOUS PLANNING CYCLE IS COMPLETED WITH VETERANS ADMINISTRATION AND ADULT BASIC EDUCATION ACT AMENDMENTS OF 1966 REVENUE SOURCES.

[3] THE NEXT PLANNING CYCLE FOR THE DIVISION BEGINS WITH THE DIVISION BUDGET.

Detailed Flow of the Revenue Source Subsystem Procedures

Chart IV-C represents a more detailed flow of the procedures to be followed to complete a planning cycle for a given revenue source. For convenience of explanation, Revenue Source 1 is used as an illustrative revenue source to explain this flow.

Base Case Phase

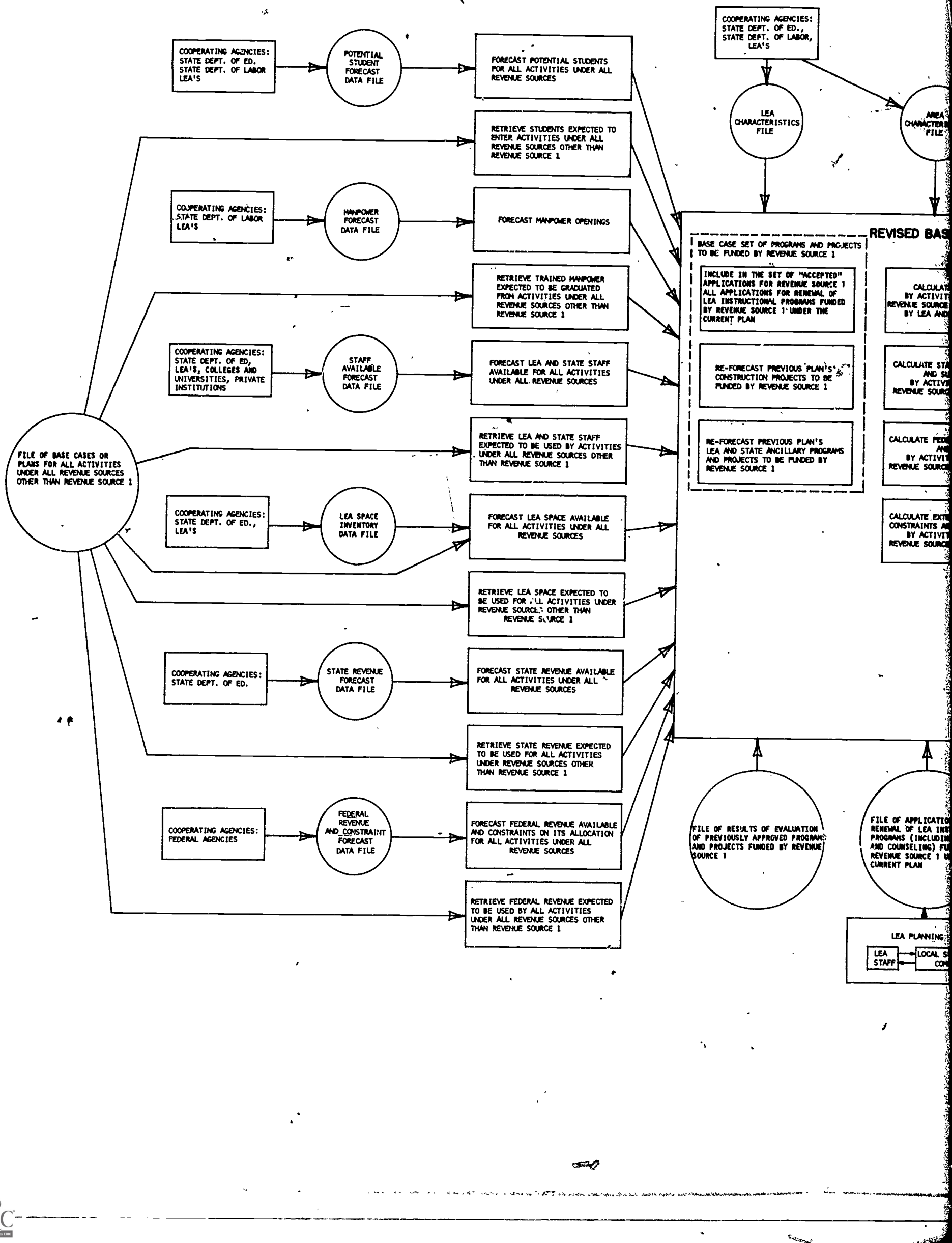
Data and information are extracted from the File of Base Cases or Plans for all activities under all revenue sources other than Revenue Source 1. These data and information will include such items as the following:

1. Students expected to enter all activities;
2. Trained manpower expected to be graduated from all activities;
3. LEA and State staff expected to be used by all activities;
4. LEA space expected to be used for all activities;
5. State revenue expected to be used for all activities; and
6. Federal revneue expected to be used by all activities.

The Report Generation Procedures will perform the task of extracting this information.

Forecasts like the following are obtained:

1. Potential students for all activities;
2. Manpower openings;


COOPERATING AGENCIES: STATE DEPT. OF ED. STATE DEPT. OF LABOR LEA'S
POTENTIAL STUDENT FORECAST DATA FILE
FORECAST POTENTIAL STUDENTS FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES
RETRIEVE STUDENTS EXPECTED TO ENTER ACTIVITIES UNDER ALL REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: STATE DEPT. OF LABOR LEA'S
MANPOWER FORECAST DATA FILE
FORECAST MANPOWER OPENINGS
RETRIEVE TRAINED MANPOWER EXPECTED TO BE GRADUATED FROM ACTIVITIES UNDER ALL REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: STATE DEPT. OF ED, LEA'S, COLLEGES AND UNIVERSITIES, PRIVATE INSTITUTIONS
STAFF AVAILABLE FORECAST DATA FILE
FORECAST LEA AND STATE STAFF AVAILABLE FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES
RETRIEVE LEA AND STATE STAFF EXPECTED TO BE USED BY ACTIVITIES UNDER ALL REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
FILE OF BASE CASES OR PLANS FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: STATE DEPT. OF ED., LEA'S
LEA SPACE INVENTORY DATA FILE
FORECAST LEA SPACE AVAILABLE FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES
RETRIEVE LEA SPACE EXPECTED TO BE USED FOR ALL ACTIVITIES UNDER REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: STATE DEPT. OF ED.
STATE REVENUE FORECAST DATA FILE
FORECAST STATE REVENUE AVAILABLE FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES
RETRIEVE STATE REVENUE EXPECTED TO BE USED FOR ALL ACTIVITIES UNDER REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: FEDERAL AGENCIES
FEDERAL REVENUE AND CONSTRAINT FORECAST DATA FILE
FORECAST FEDERAL REVENUE AVAILABLE AND CONSTRAINTS ON ITS ALLOCATION FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES
RETRIEVE FEDERAL REVENUE EXPECTED TO BE USED BY ALL ACTIVITIES UNDER ALL REVENUE SOURCES OTHER THAN REVENUE SOURCE 1
COOPERATING AGENCIES: STATE DEPT. OF ED., STATE DEPT. OF LABOR, LEA'S
LEA CHARACTERISTICS FILE
AREA CHARACTER FILE
REVISED BAS
BASE CASE SET OF PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1
INCLUDE IN THE SET OF "ACCEPTED" APPLICATIONS FOR REVENUE SOURCE 1 ALL APPLICATIONS FOR RENEWAL OF LEA INSTRUCTIONAL PROGRAMS FUNDED BY REVENUE SOURCE 1 UNDER THE CURRENT PLAN
RE-FORECAST PREVIOUS PLAN'S CONSTRUCTION PROJECTS TO BE FUNDED BY REVENUE SOURCE 1
RE-FORECAST PREVIOUS PLAN'S LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1
CALCULAT BY ACTIVIT REVENUE SOURCE BY LEA AND
CALCULATE STA AND SU BY ACTIVI REVENUE SOURC
CALCULATE FED AN BY ACTIVI REVENUE SOURC
CALCULATE EXTE CONSTRAINTS A BY ACTIVI REVENUE SOURC
FILE OF RESULTS OF EVALUATION OF PREVIOUSLY APPROVED PROGRAMS AND PROJECTS FUNDED BY REVENUE SOURCE 1
FILE OF APPLICATIO RENEWAL OF LEA INS PROGRAMS (INCLUDIN AND COUNSELING) FU REVENUE SOURCE 1 U CURRENT PLAN
LEA PLANNING
LEA STAFF
LOCAL S COM

GENERAL PROCEDURES FOR PLANNI

PLANNING IS ACCOMPLISHED WITHIN THE CO

AREA CHARACTERISTICS FILE

STATE PERSONNEL, MATERIALS, AND EQUIPMENT COST FACTORS FILE

FILE OF DESIRED INDICATOR LEVELS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS

EVISED BASE CASE

CALCULATE EXPENDITURES BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

CALCULATE STATE REVENUE DEFICIT AND SURPLUS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL

CALCULATE FEDERAL REVENUE DEFICIT AND SURPLUS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL

CALCULATE EXTENT TO WHICH FEDERAL CONSTRAINTS ARE MET BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL

SOCIAL DEMAND INDICATORS:
CALCULATE EXPECTED RATIO OF STUDENTS SERVED TO POTENTIAL STUDENTS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

PROCESS-STAFF INDICATORS:
CALCULATE EXPECTED RATIO OF LEA AND STATE STAFF NEEDED TO STAFF AVAILABLE BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

PROCESS-SPACE INDICATORS:
CALCULATE EXPECTED RATIO OF LEA SPACE NEEDED TO SPACE AVAILABLE BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

PROCESS-EXPENDITURE INDICATORS:
CALCULATE EXPECTED EXPENDITURE INDICATORS, E.G., PERCENT EXPENDITURES IN URBAN AREAS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS

OTHER PROCESS INDICATORS
CALCULATE EXPECTED LEA PROCESS QUALITY BY ACTIVITY TYPE, BUREAU, AND OVERALL FOR REVENUE SOURCE 1

OUTPUT-MANPOWER SUPPLY INDICATORS:
CALCULATE EXPECTED RATIO OF GRADUATING MANPOWER TO MANPOWER OPENINGS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

OUTPUT-PERSONAL ENRICHMENT INDICATORS:
CALCULATE EXPECTED RATIO OF GRADUATING STUDENTS TO POTENTIAL STUDENTS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

CALCULATE BASE CASE INDICATOR GAPS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS

CALCULATE BASE CASE EXTENT OF COMPLIANCE WITH DIVISION POLICY OF FEDERAL AND STATE REVENUES TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS

FILE OF DIVISION POLICY OF FEDERAL AND STATE REVENUE TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL

ARE THE BASE CASE INDICATOR GAPS UNSATISFACTORY?

DOES FEDERAL OR STATE REVENUE DEFICIT OR SURPLUS EXIST?

ARE FEDERAL CONSTRAINTS UNMET?

IS DIVISION POLICY ABOUT THE USE OF FEDERAL AND STATE REVENUE UNMET?

BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS

YES

NO

ACCEPT THE BASE CASE SET OF PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1 AS CONSTITUTING THE NEW PLAN FOR REVENUE SOURCE 1

STORE THE NEW PLAN FOR REVENUE SOURCE 1

COMMUNICATE THE NEW PLAN FOR REVENUE SOURCE 1 TO FEDERAL AND STATE AGENCIES AND WITHIN THE DIVISION

COMMUNICATE THE ACCEPTANCE OR REJECTION OF LEA INSTRUCTIONAL PROGRAMS, ANCILLARY PROGRAMS AND PROJECTS AND STATE ANCILLARY PROGRAMS AND PROJECTS

FILE OF BASE CASE OR PLAN FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES

FILE OF APPLICATIONS FOR RENEWAL OF LEA INSTRUCTIONAL PROGRAMS (INCLUDING GUIDANCE AND COUNSELING) FUNDED BY REVENUE SOURCE 1 UNDER THE CURRENT PLAN

FILE OF CURRENT PLAN'S LEA AND STATE CONSTRUCTION PROJECTS TO BE FUNDED BY REVENUE SOURCE 1

FILE OF CURRENT PLAN'S LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1

FILE OF CURRENT PLAN OR BASE CASE FOR REVENUE SOURCE 1

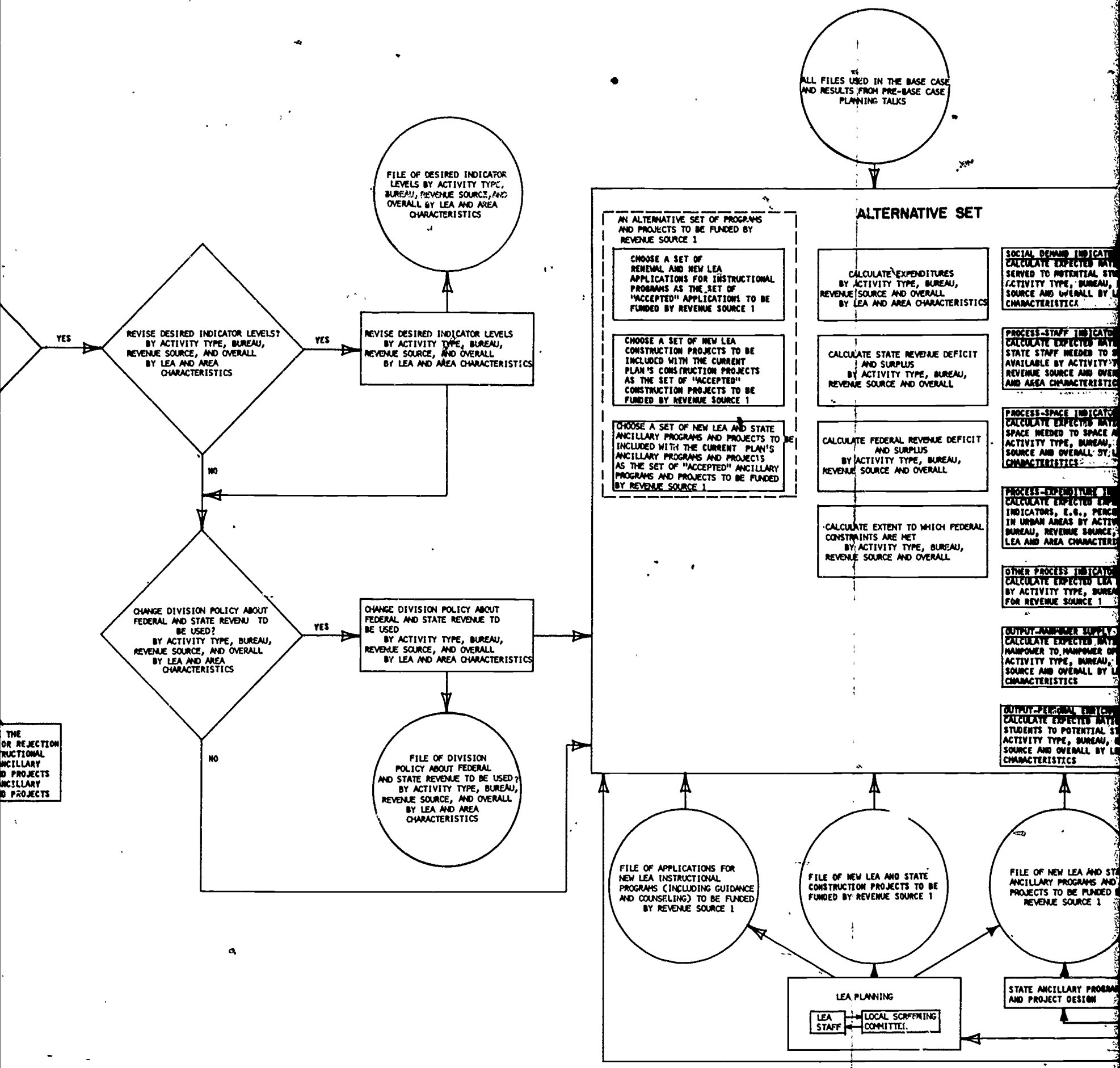
LEA PLANNING

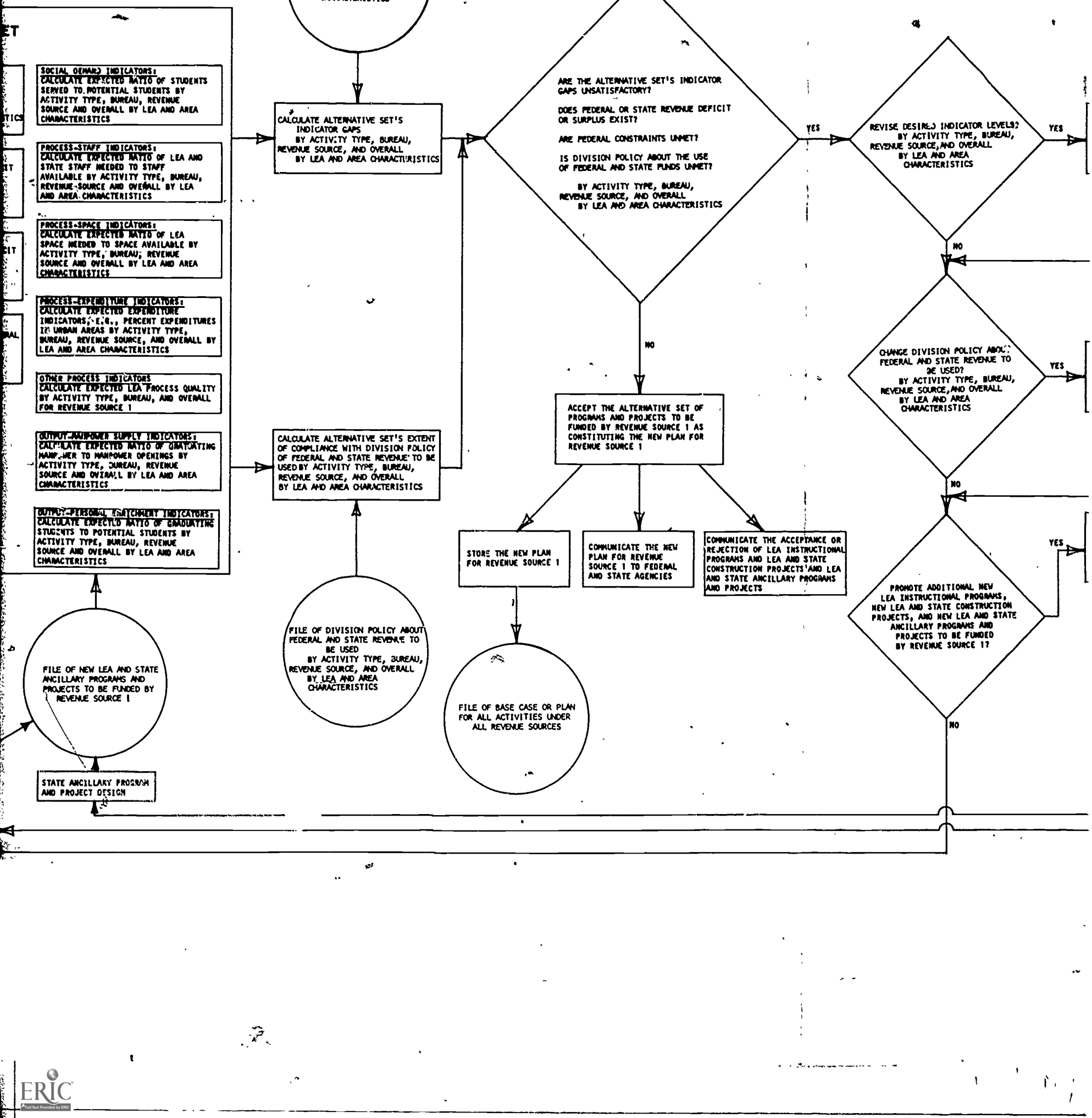
LEA STAFF → LOCAL SCREENING COMMITTEE

CHART IX C

S FOR PLANNING THE ACTIVITIES TO BE FUNDED BY REVENUE SOURCE 1

HED WITHIN THE CONTEXT OF ACTIVITIES TO BE FUNDED BY ALL OTHER REVENUE SOURCES

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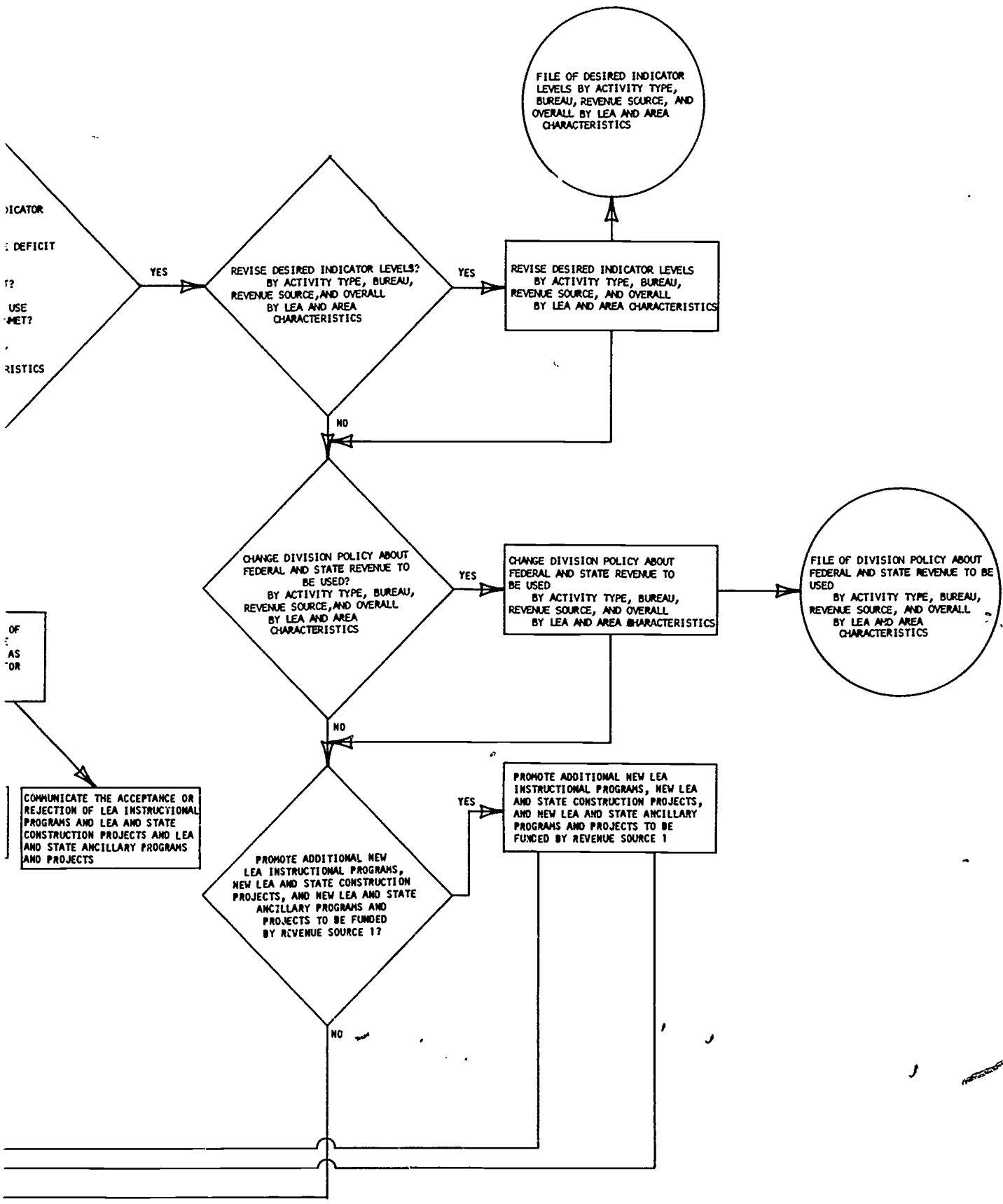
SOCIAL DEMAND INDICATORS:
CALCULATE EXPECTED RATIO OF STUDENTS SERVED TO POTENTIAL STUDENTS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS
PROCESS-STAFF INDICATORS:
CALCULATE EXPECTED RATIO OF LEA AND STATE STAFF NEEDED TO STAFF AVAILABLE BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS
PROCESS-SPACE INDICATORS:
CALCULATE EXPECTED RATIO OF LEA SPACE NEEDED TO SPACE AVAILABLE BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS
PROCESS-EXPENDITURE INDICATORS:
CALCULATE EXPECTED EXPENDITURE INDICATORS, E.G., PERCENT EXPENDITURES IN URBAN AREAS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
OTHER PROCESS INDICATORS
CALCULATE EXPECTED LEA PROCESS QUALITY BY ACTIVITY TYPE, BUREAU, AND OVERALL FOR REVENUE SOURCE 1
OUTPUT-MANPOWER SUPPLY INDICATORS:
CALCULATE EXPECTED RATIO OF GRADUATING MANPOWER TO MANPOWER OPENINGS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS
OUTPUT-PERSONAL ENRICHMENT INDICATORS:
CALCULATE EXPECTED RATIO OF GRADUATING STUDENTS TO POTENTIAL STUDENTS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE AND OVERALL BY LEA AND AREA CHARACTERISTICS
FILE OF NEW LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1
STATE ANCILLARY PROGRAM AND PROJECT DESIGN
FILE OF DESIRED INDICATOR LEVELS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
CALCULATE ALTERNATIVE SET'S INDICATOR GAPS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
CALCULATE ALTERNATIVE SET'S EXTENT OF COMPLIANCE WITH DIVISION POLICY OF FEDERAL AND STATE REVENUE TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
FILE OF DIVISION POLICY ABOUT FEDERAL AND STATE REVENUE TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
ARE THE ALTERNATIVE SET'S INDICATOR GAPS UNSATISFACTORY?
DOES FEDERAL OR STATE REVENUE DEFICIT OR SURPLUS EXIST?
ARE FEDERAL CONSTRAINTS UNMET?
IS DIVISION POLICY ABOUT THE USE OF FEDERAL AND STATE FUNDS UNMET?
BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
YES
NO
REVISE DESIRED INDICATOR LEVELS? BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
YES
NO
CHANGE DIVISION POLICY ABOUT FEDERAL AND STATE REVENUE TO BE USED? BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
YES
NO
PROMOTE ADDITIONAL NEW LEA INSTRUCTIONAL PROGRAMS, NEW LEA AND STATE CONSTRUCTION PROJECTS, AND NEW LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1?
YES
NO
ACCEPT THE ALTERNATIVE SET OF PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1 AS CONSTITUTING THE NEW PLAN FOR REVENUE SOURCE 1
STORE THE NEW PLAN FOR REVENUE SOURCE 1
COMMUNICATE THE NEW PLAN FOR REVENUE SOURCE 1 TO FEDERAL AND STATE AGENCIES
COMMUNICATE THE ACCEPTANCE OR REJECTION OF LEA INSTRUCTIONAL PROGRAMS AND LEA AND STATE CONSTRUCTION PROJECTS AND LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS
FILE OF BASE CASE OR PLAN FOR ALL ACTIVITIES UNDER ALL REVENUE SOURCES


ICATOR
DEFICIT
T?
USE
MET?
RISTICS
YES
REVISE DESIRED INDICATOR LEVELS? BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE,AND OVERALL BY LEA AND AREA CHARACTERISTICS
YES
REVISE DESIRED INDICATOR LEVELS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
FILE OF DESIRED INDICATOR LEVELS BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
NO
CHANGE DIVISION POLICY ABOUT FEDERAL AND STATE REVENUE TO BE USED? BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE,AND OVERALL BY LEA AND AREA CHARACTERISTICS
YES
CHANGE DIVISION POLICY ABOUT FEDERAL AND STATE REVENUE TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
FILE OF DIVISION POLICY ABOUT FEDERAL AND STATE REVENUE TO BE USED BY ACTIVITY TYPE, BUREAU, REVENUE SOURCE, AND OVERALL BY LEA AND AREA CHARACTERISTICS
NO
OF
AS
OR
COMMUNICATE THE ACCEPTANCE OR REJECTION OF LEA INSTRUCTIONAL PROGRAMS AND LEA AND STATE CONSTRUCTION PROJECTS AND LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS
PROMOTE ADDITIONAL NEW LEA INSTRUCTIONAL PROGRAMS, NEW LEA AND STATE CONSTRUCTION PROJECTS, AND NEW LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 17
YES
PROMOTE ADDITIONAL NEW LEA INSTRUCTIONAL PROGRAMS, NEW LEA AND STATE CONSTRUCTION PROJECTS, AND NEW LEA AND STATE ANCILLARY PROGRAMS AND PROJECTS TO BE FUNDED BY REVENUE SOURCE 1
NO

3. LEA staff available for all activities;

4. LEA space available for all activities;

5. State revenue available for all activities; and

6. Federal revenue available and constraints on its allocation for all activities.

Data and information on students expected to enter, manpower expected to graduate, staff and space needed, and State and Federal revenue needed is extracted from the File of Renewal Applications of LEA Instructional Programs, the File of Previously Approved LEA and State Construction Projects, and the File of Previously Approved LEA and State Ancillary Programs and Projects for Revenue Source 1. This information is combined with information for all other revenue sources and compared with the forecasts to determine expected Social Demand, Process, and Output indicator levels, such as the following:

1. Percent potential students served,

2. Percent manpower openings filled,

3. Percent needed of available staff,

4. Percent needed of available space which is available,

5. Percent needed of available State revenue, and

6. Percent needed of available Federal revenue.

Expenditures, expected indicator levels, State revenue deficit or surplus, federal revenue deficit or surplus, and the extent to which federal constraints are met are computed, where appropriate, by activity type, bureau, revenue source and total Division. The computations for expenditures and expected

indicator levels are also computed in terms of LEA and area characteristics. LEA and area characteristics are extracted from their respective files. Expenditures are computed and forecast over time in terms of state personnel, materials and equipment cost factors.

Indicator gaps, the difference between desired and expected indicator levels, are computed, where appropriate, by activity type, bureau, revenue source and total Division and by LEA and area characteristics. This process requires data and information from the current plans or revised base cases of all revenue sources, including Revenue Source 1. In the same fashion, computations are performed to determine the extent of compliance with Division policy that is concerned with Federal and State revenues to be used by activity type, bureau, revenue source and total Division and by LEA and area characteristics.

The results of the above computations plus the computations performed in the Revised Base Case Process for all revenue sources other than for Revenue Source 1 is a series of reports: (1) Revised Base Case Report for Revenue Source 1, (2) Revised Base Case Reports for all other revenue sources, and (3) Summary Report of all revenue sources. The Assistant Commissioner of Vocational Education and his staff are now in a position to evaluate the Revised Base Case Report of Revenue Source 1. <u>This evaluation is performed within the context of all revenue sources by activity type, bureau, revenue source and total Division and</u>

by LEA and area characteristics. The following questions are answered during the evaluation:

1. Are the indicator gaps being closed at an unsatisfactory rate?
2. Does a Federal or State revenue deficit or surplus exist?
3. Are Federal constraints unmet?
4. Is Division policy concerning the use of Federal and State revenue unmet?

If the answers to these questions are "no", then the Revised Base Case is satisfactory and, therefore, constitutes the New Plan for Revenue Source 1. The New Plan and an annual budget, if required, is developed. This Plan is communicated to the appropriate State and Federal authorities for their approval. Following this approval the LEA's, State agencies and bureaus within the Division are informed of the acceptance of the New Plan. The New Plan is then stored in the appropriate file.

If the Revised Base Case for Revenue Source 1 is not found to be satisfactory, the Assistant Commissioner and his staff determine whether or not they wish to revise the desired indicator levels. Changes in the desired indicator levels are placed in the File of Desired Indicator Levels. The Assistant Commissioner and his staff may also consider the possibility of changing Division policy about Federal and State revenue. If changes in policy are made these changes are placed in a file designated for that purpose.

Alternative Set Phase

Information concerning policy changes and data and information from the files used in the Base Case Phase are now utilized in the Alternative Set Process. The files of New Applications for LEA Instructional Programs, New LEA and State Construction Projects, New LEA and State Ancillary Programs and Projects also provide data and information to the Alternative Set Process. An Alternative Set of Programs and Projects is formed from: (1) a selected number of renewal applications and a selected number of new LEA applications for instructional programs, (2) previously approved construction projects and a selected number of new construction projects, and (3) previously approved ancillary programs and projects and a selected number of new ancillary programs and projects.

Expenditures, expected indicator levels, State revenue deficit or surplus, Federal revenue deficit or surplus, and extent to which Federal constraints are met is computed for the Alternative Set by activity type, bureau, revenue source and total Division. Expenditures and expected levels of indicators are also computed by LEA and area characteristics. The indicator gaps are computed, where appropriate, by activity type, bureau, revenue source and total Division and by LEA and area characteristics. Finally, computations are performed to determine the extent to which the Alternative Set complies with Division policy concerning Federal and State revenues. These computations plus the Alternative Set computations for all

revenue sources are placed in the appropriate files. The Report Generation Procedures produce a series of reports that will be employed during the Alternative Set Evaluation Process, viz., (1) Alternative Set Report for Revenue Source 1, (2) Alternative Set Reports for all other revenue sources, and (3) Summary Report for all revenue sources.

Upon receipt of these reports the Assistant Commissioner and his staff evaluate the Alternative Set for Revenue Source 1 in the milieu of all of the resource commitments for the entire Division. The same questions that were posed in the Base Case Evaluation Process are also posed here. If the Alternative Set is unsatisfactory, it then constitutes the New Plan for Revenue Source 1 and is handled in the same manner as described in the Base Case Evaluation Process. However, if the Alternative Set is unsatisfactory, the Assistant Commissioner and his staff have three options: (1) they may revise the desired indicator levels and change Division policy about Federal and State revenue; (2) they may decide to promote additional new LEA instructional programs, construction projects and ancillary programs and projects, new State construction projects, and new ancillary programs and projects; or (3) they may decide to form a new Alternative Set. This process continues until the Assistant Commissioner and his staff have selected a satisfactory Alternative Set or New Plan. The New Plan is formalized and, where required, an annual budget is developed. The process of

approval and communication is followed by storing the New Plan in the appropriate file.

Data and Information Files

The Data and Information Files as discussed in Chapter III are coupled to the Report Generation Procedures. A set of files for the Division and a set of files for each of the revenue sources is required. The following files constitute an illustrative set for the Division:

1. Potential Student Forecast,
2. Manpower Forecast (this file will contain additional information on manpower characteristics),
3. Staff Available Forecast,
4. LEA Space Inventory,
5. State Revenue Forecast,
6. Federal Revenue and Constraint Forecast,
7. LEA Characteristics,
8. Area Characteristics,
9. State Personnel, Materials and Equipment Cost Factors,
10. Desired Indicator Levels, and
11. Division Policy for Federal and State Revenue.

The following files are required for each revenue source:

1. Base Case or Plan,
2. Results of the Evaluations of Previously Approved Programs and Projects,

3. Applications for Renewal of LEA Instructional Programs (including guidance and counselling),
4. Previously Approved LEA and State Construction Projects,
5. Previously Approved LEA Ancillary Programs and Projects and State Ancillary Programs and Projects,
6. Applications for new LEA Instructional Programs (including guidance and counselling), New LEA and State Construction Projects, and
7. New LEA Ancillary Programs and Projects and New State Ancillary Programs, Projects and Services.

CHAPTER V

WORK PROGRAM FOR THE DEVELOPMENT, TESTING, MODIFICATION AND IMPLEMENTATION OF THE PROPOSED PLANNING SYSTEM

Overview of the Work Program

The work program discussed in this chapter covers a period of three years beginning on July 1, 1970 and concluding on June 30, 1973. The objective of the work program is to produce, at the end of the three year period, a completely operational planning system for the New Jersey Division of Vocational Education. Several factors were taken into consideration in establishing the work program:

1. The planning cycles of the continuing revenue sources
   -- the duration of those cycles and the point at which they occur in the total planning cycle of the Division.
2. All components of the Planning System are to go through two implementation, evaluation and modification periods that correspond with the planning cycles of the Division.
3. Most of the components of the Planning System will be available the first year of the project.

The work program is divided into three phases: Phase I begins on July 1, 1970 and ends on April 30, 1971; Phase II

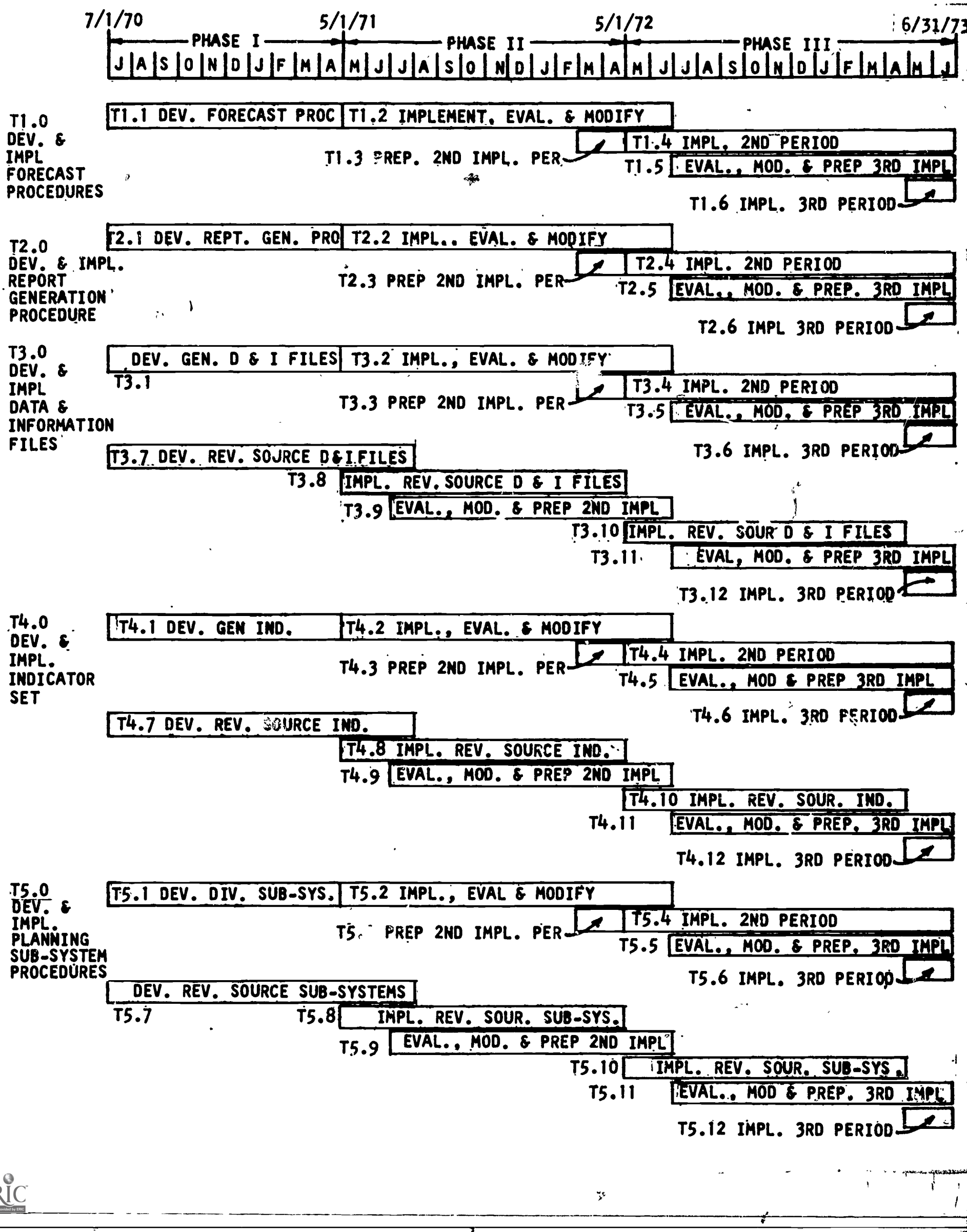
begins as of May 1, 1971 and terminates April 30, 1972; and Phase III begins May 1, 1972 and ends June 30, 1973. These phases are keyed to the beginning of the 1971-72 and 1972-73 planning cycles of the Division. Most of the components of the Planning System will be ready for the first implementation, evaluation and modification period, which begins on May 1, 1971. The 1971-72 planning cycle starts at this time. The first implementation of all the components of the Planning System will be completed by April 30, 1972. The evaluations and modifications on all but three of the components will also be completed by April 30, 1972. The work on the three remaining components will be completed by June 30, 1972. All components will go through a second implementation period and be evaluated and modified for the last time during the project. This work will be accomplished from May 1, 1972 through June 30, 1973. Some of the components will start their third implementation period on May 1, 1973. All components of the Planning System will be used during two planning cycles of the Division. Each component will be ready for use as the need for the component arises during these two planning cycles.

The work program is illustrated on Chart V-A. The three phases are shown on the Chart along with the task streams that are necessary to develop the components of the Planning System:

1. Task Stream 1.0 -- Develop and Implement Forecast Procedures,
2. Task Stream 2.0 -- Develop and Implement Report Generation Procedures,

CHART V — A

MAIN TASK STREAMS FOR THE DEVELOPMENT, TESTING AND MODIFICATION OF THE VOCATIONAL EDUCATION PLANNING SYSTEM



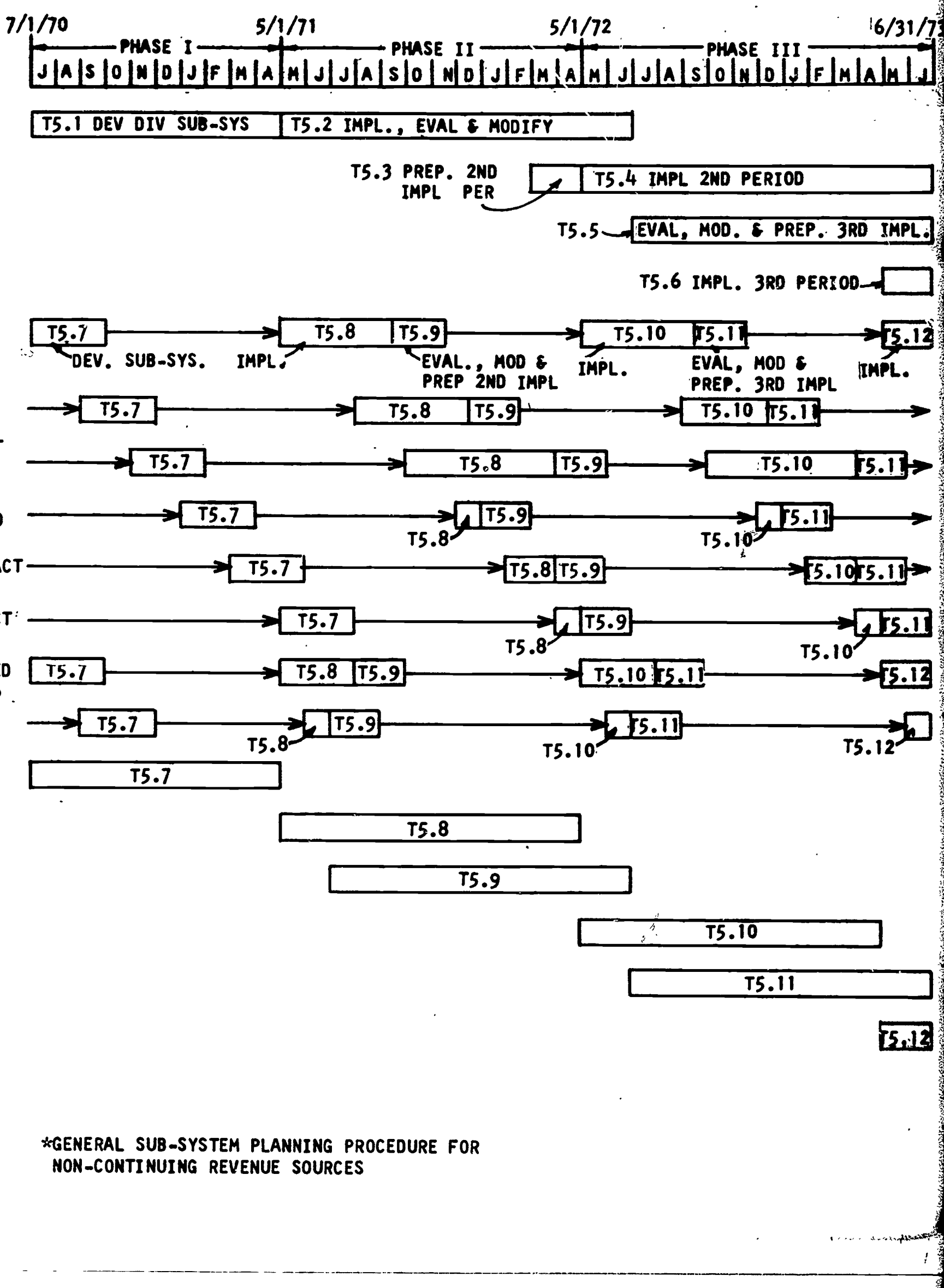
3. Task Stream 3.0 -- Develop and Implement Data and Information Files,
4. Task Stream 4.0 -- Develop and Implement Indicator Sets, and
5. Task Stream 5.0 -- Develop and Implement Planning Subsystem Procedures.

Each task stream is subdivided into a series of tasks. Charts V-B, V-C, and V-D show the tasks in detail for Task Streams 3.0, 4.0 and 5.0. A detailed listing of tasks by phase is contained in the section, "Phasing of the Work Program". The tasks may also be examined across task streams by purpose:

1. Development of the components,
2. Implementation of the components during the first period,
3. Evaluation and modification of the components and preparation for the second period,
4. Implementation of the components during the second period,
5. Evaluation and modification of the components and preparation for the 1973-74 Division Planning Cycle, and
6. Implementation of the components during the 1973-74 Division Planning Cycle.

CHART V — B

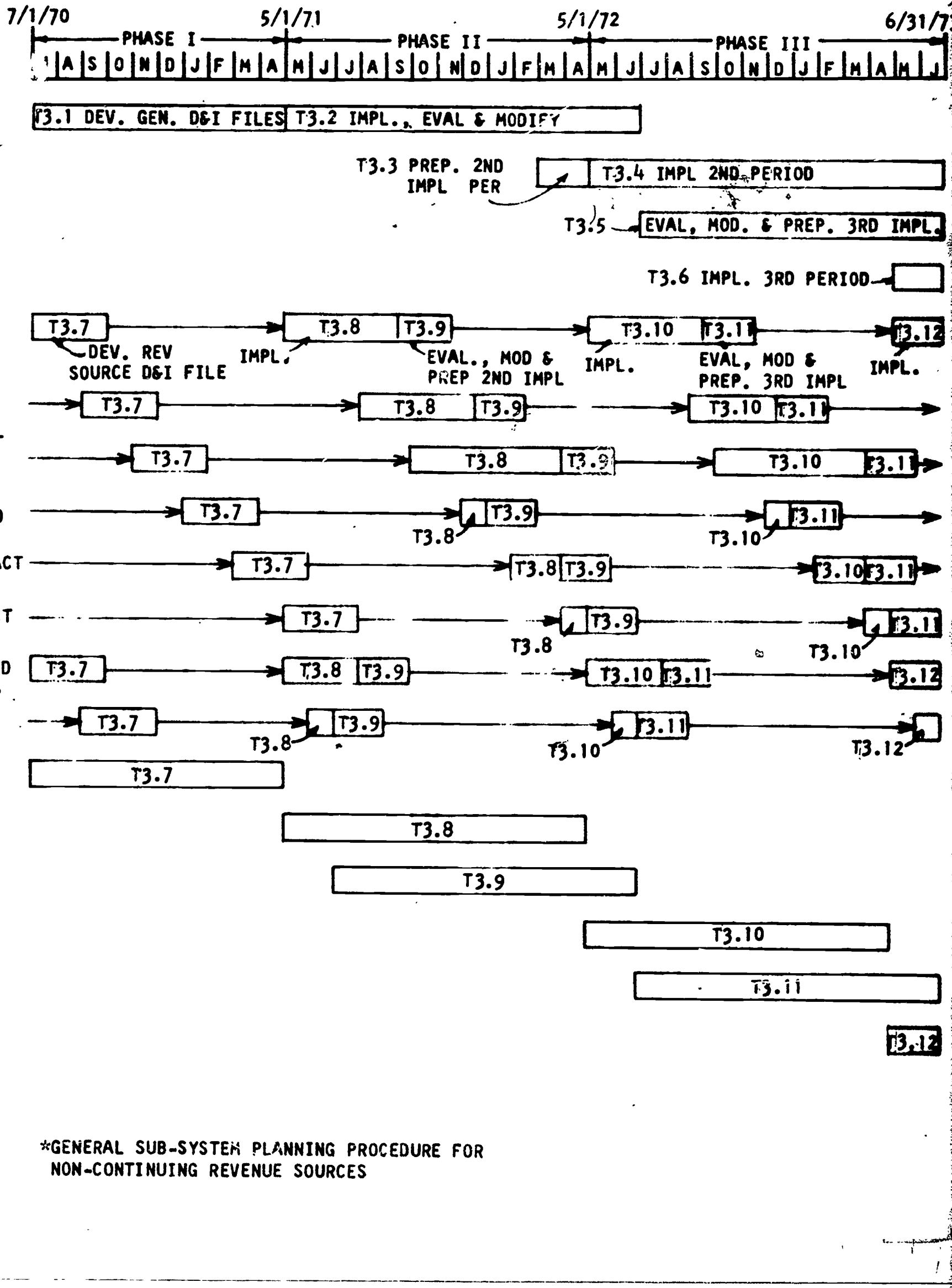
DEVELOPMENT AND IMPLEMENTATION OF PLANNING SUB-SYSTEM PROCEDURES (TASK GROUP 5.0)



*GENERAL SUB-SYSTEM PLANNING PROCEDURE FOR NON-CONTINUING REVENUE SOURCES

CHART V — C

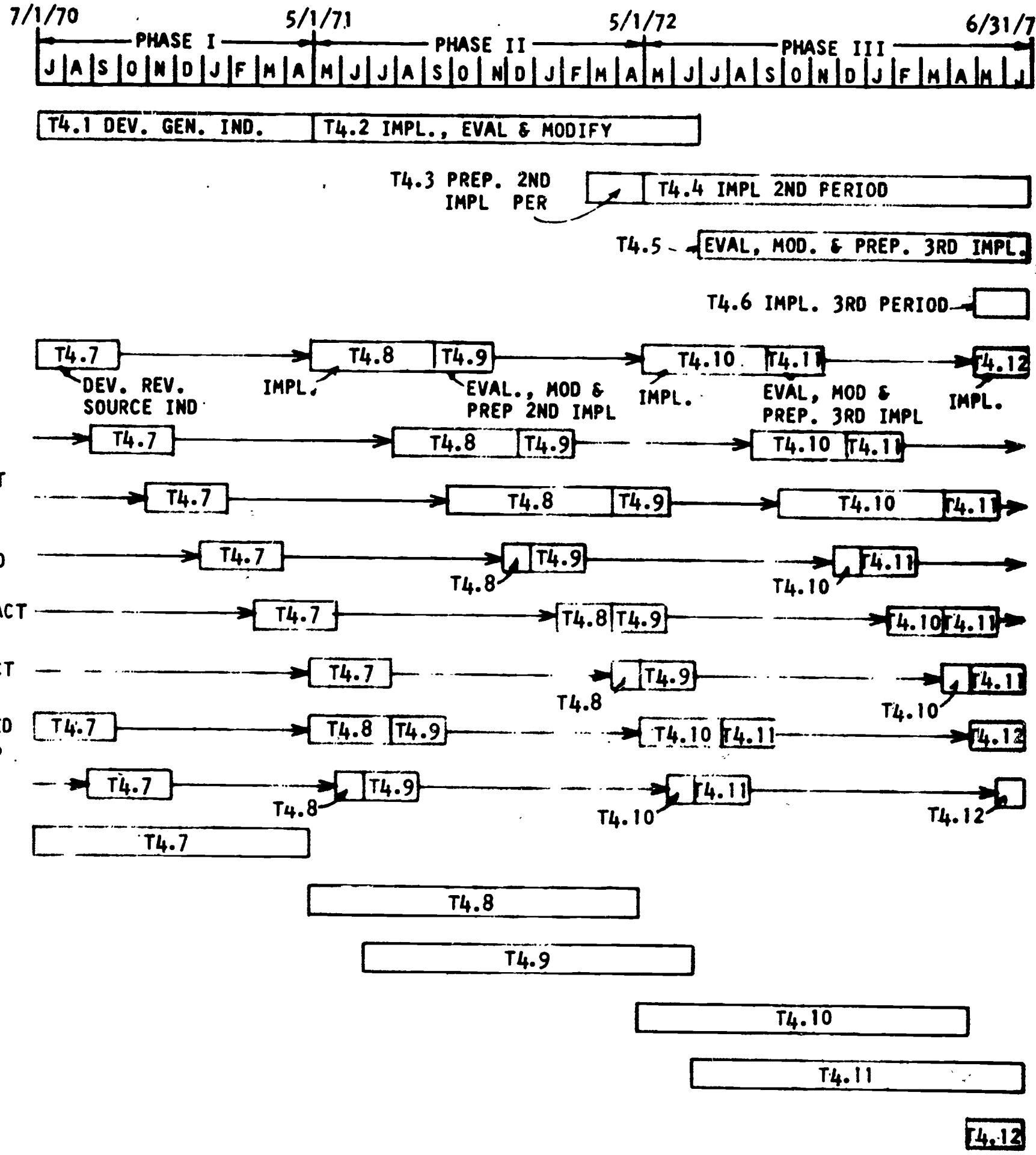
DEVELOPMENT AND IMPLEMENTATION OF DATA AND INFORMATION FILES (TASK GROUP 3.0)



*GENERAL SUB-SYSTEM PLANNING PROCEDURE FOR NON-CONTINUING REVENUE SOURCES

CHART V — D

DEVELOPMENT AND IMPLEMENTATION OF INDICATOR SET (TASK GROUP 4.0)



*GENERAL SUB-SYSTEM PLANNING PROCEDURE FOR NON-CONTINUING REVENUE SOURCES

Development

All tasks streams are keyed to Task Stream 5.0 which is concerned with the development and implementation of the Planning Subsystem Procedures. A close exmaination of Chart V-A will reveal this fact. Because Planning Subsystem Procedures, Data and Information Files and Indicator Sets must be developed and implemented for each continuing and non-continuing revenue source of the Division, these tasks have been detailed on Charts V-B, V-C and V-D. Note that these tasks are sequentially staged to match the order in which all but two of the planning cycles for continuing revenue sources occur in the planning cycle for the total Division. Development of the Data and Information Files, Indicator Sets, and Subsystem Procedures for the Adult Basic Education Act Amendments of 1966 and the Veterans Administration Revenue Sources has been advanced so that each of these revenue sources can pass through two complete implementation, evaluation and modification periods before June 30, 1973.

Development of a general set of Planning Subsystem Procedures, Data and Information Files and Indicator Sets for non-continuing revenue sources, which provide funds for special projects, will be undertaken in parallel with the companion components for the continuing revenue sources. This work will be eased in some cases because certain continuing revenue sources (see Chapter IV) provide funds for special projects. It is assumed that these components with minor modifications will be useful in planning future special projects.

Implementation of the Components for the First Period

Before the first planning cycle is implemented for the Division Budget Revenue Source, revised base cases will be developed for all but two of the continuing revenue sources (Manpower Development and Training Act Amendments of 1969 and Social Security Amendment Act of 1967 being the exceptions). If a multi-year plan (Current Plan) exists for a given revenue source this plan will be updated and utilized as a revised base case. However, if a Current Plan does not exist for a given revenue source the annual budget developed during the previous planning cycle will be updated and forecast over a five-year planning horizon. The updated annual budget and the five-year forecast will constitute the revised base case for the revenue source. Revised base cases will be developed in the same manner for non-continuing revenue sources.

Evaluation and Modification of the Components and Preparation for the Second Period

All the modifications on the Data and Information Files, Indicator Sets, and Planning Subsystem Procedures of three revenue sources (Vocational Education Act Amendments of 1968, Manpower Development and Training Act Amendments of 1969 and Social Security Act Amendments of 1967) will not have been completed before the beginning of the second implementation, evaluation and modification period. Special attention, however, will be given to those portions of the above mentioned

modifications that are necessary to begin the planning cycles for the Division's Budget, Adult Basic Education Act Amendments of 1966 and Veterans Administration Revenue Sources. All modifications of the components will be completed before the beginning of the planning cycle of the State Grants-in-Aid Revenue Source. Modifications to non-continuing revenue source components will be completed before the beginning of the second period of implementation, evaluation and modification.

Implementation of the Components During the Second Period

All continuing revenue sources will complete a second period of testing and modification. All special projects funded by non-continuing revenue sources identified at the beginning of the project will also have completed a second testing and modification process. All components of the Planning System will incorporate the improvements resulting from the first implementation.

Evaluation and Modification of the Components and Preparation for 1973-74 Division Planning Cycle

The Forecast Procedures, Report Generation Procedures, Data and Information Files, Indicator Sets, and Planning Subsystem Procedures will be modified for the second and last time during the project. The procedures and documentation manuals and materials will be cleaned up and placed in their final form. The personnel of the Division will receive their final training, and

preparations will be made to turn the Planning System over to the Division.

Implementation of the Components During the 1973-74 Division Planning Cycle

Special projects funded by non-continuing revenue sources and one continuing revenue source will begin the planning cycle of the Division (Division Budget). Adult Basic Education Act Amendments of 1966 and Veterans Administration Revenue Sources will be finishing their planning cycles and, thus concluding the 1972-73 planning cycle for the Division.

Phasing of the Work Program

The tasks are shown by phase in this section (refer to Charts V-A, V-B, V-C and V-D). The dates enclosed in parentheses cover the time period allowed to complete the task.

1. Phase I contains the following tasks (7/1/70-4/30/71):
   a. Task 1.1 - Develop Forecast Procedures and prepare for the first implementation period (7/1/70-4/30/71);
   b. Task 2.1 - Develop Report Generation Procedures and prepare for the first implementation period (7/1/70-4/30/71);

c. Task 3.1 - Develop the General Data and Information Files and prepare for the first implementation period (7/1/70-4/30/71);

d. Task 3.7 - Develop and implement the Data and Information Files for continuing and non-continuing revenue sources and prepare for the first implementation period (7/1/70-7/31/72);

e. Task 4.1 - Develop the General Social Demand, Process and Output Indicators and prepare for the first implementation period (7/1/70-4/30/71);

f. Task 4.7 - Develop the Social Demand, Process and Output Indicators for the continuing and non-continuing revenue sources and prepare for the first implementation period (7/1/70-7/31/72);

g. Task 5.1 - Develop the Division level Planning Subsystem Procedure and prepare for the first implementation period (7/1/70-4/30/71); and

h. Task 5.7 - Develop the Subsystem Procedures for each continuing and non-continuing revenue source and prepare for the first implementation period (7/1/70-7/31/72).

2. Phase II contains the following tasks (5/1/71-4/30/72):

a. Task 1.2 - Implement, evaluate and modify the Forecast Procedures (5/1/71-6/30/72);

b. Task 1.3 - Prepare for the second implementation period with the Forecast Procedures (3/1/72-4/30/72);

c. Task 2.2 - Implement, evaluate and modify the Report Generation Procedures (5/1/71-6/30/72);

d. Task 2.3 - Prepare for the second implementation with the Report Generation Procedures (3/1/72-4/30/72);

e. Task 3.2 - Implement, evaluate and modify the General Data and Information Files (5/1/71-6/30/72);

f. Task 3.3 - Prepare for the second implementation period with the General Data and Information Files (3/1/71-4/30/72);

g. Task 3.7 - Continue developing the Data and Information Files for the continuing and non-continuing revenue sources (7/1/70-7/31/72);

h. Task 3.8 - Continue to implement the Data and Information Files for each continuing and non-continuing revenue source (5/1/71-4/30/72);

i. Task 3.9 - Evaluate and modify the Data and Information Files for each continuing and non-continuing revenue source and prepare for the second implementation period (7/1/71-6/30/72);

j. Task 4.2 - Implement, evaluate and modify and expand the General Indicator Subset (3/1/71-4/30/72);

k. Task 4.3 - Prepare for the second implementation period for the General Indicator Subset (3/1/71-4/30/72);

l. Task 4.7 - Continue development of the Social Demand, Process and Output Indicators for the continuing and non-continuing revenue sources (7/1/70-7/31/72);

m. Task 4.8 - Implement the indicators for each continuing and non-continuing revenue source (5/1/71-4/30/72);

n. Task 4.9 - Evaluate, modify and expand each continuing and non-continuing revenue source Indicator Subset and plan for the second implementation period (7/1/71-6/30/72);

o. Task 5.2 - Implement, evaluate and modify the Division level Planning Subsystem Procedures (5/1/71-6/30/72);

p. Task 5.3 - Prepare for the second implementation period with the Division level Planning Subsystem Procedures (3/1/71-4/30/72);

q. Task 5.7 - Continue development of the Subsystem Procedures for each continuing and non-continuing revenue source (7/1/70-7/31/72);

r. Task 5.8 - Implement the Subsystem Procedures for each continuing and non-continuing revenue source (5/1/70-4/30/72); and

s. Task 5.9 - Evaluate and modify the Subsystem Procedures for each continuing and non-continuing revenue source and prepare for the second implementation period (7/1/71-6/30/72).

3. Phase III contains the following tasks (5/1/72-6/30/73):

a. Task 1.2 - Continue to implement, evaluate and modify the Forecast Procedures (5/1/71-6/30/72);

b. Task 1.4 - Implement the Forecast Procedures (5/1/72-6/30/73);

c. Task 1.5 - Evaluate and modify the forecast procedures and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

d. Task 1.6 - Implement the Forecast Procedures (5/1/73-6/30/73);

e. Task 2.2 Continue to implement, evaluate and modify the Report Generation Procedures (5/1/71-6/30/72);

f. Task 2.4 - Implement the Report Generation Procedures (5/1/72-6/30/73);

g. Task 2.5 - Evaluate and modify the Report Generation Procedures and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

h. Task 2.6 - Implement the Report Generation Procedures (5/1/73-6/30/73);

i. Task 3.2 - Continue to implement, evaluate and modify the General Data and Information files (5/1/71-6/30/72);

j. Task 3.4 - Implement the General Data and Information Files (5/1/72-6/30/73);

k. Task 3.5 - Evaluate and modify the General Data and Information Files and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

l. Task 3.6 - Implement the General Data and Information Files (5/1/73-6/30/73);

m. Task 3.9 - Continue to evaluate and modify the Data and Information Files for the continuing and non-continuing revenue sources and continue preparation for the second implementation period (7/1/71-6/30/72);

n. Task 3.10 - Implement the Data and Information Files for each continuing and non-continuing revenue source (5/1/72-4/30/73);

o. Task 3.11 - Evaluate and modify the Data and Information Files for each continuing and non-continuing revenue source and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

p. Task 3.12 - Implement the Data and Information Files for each continuing and non-continuing revenue source (5/1/73-6/30/73);

q. Task 4.2 - Continue to implement, evaluate, modify and expand the General Indicator Subset (5/1/71-6/30/72);

r. Task 4.4 - Implement the General Indicator Subset (5/1/72-6/30/73);

s. Task 4.5 - Evaluate, modify and expand the General Indicator Subset and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

t. Task 4.6 - Implement the General Indicator Subset (5/1/73-6/30/73);

u. Task 4.9 - Continue to evaluate, modify and expand each continuing and non-continuing revenue source Indicator Subset and continue planning for the second implementation period (7/1/71-6/30/72);

v. Task 4.10 - Implement the Indicator Subsets for each revenue source (5/1/72-4/30/73);

w. Task 4.11 - Evaluate, modify and expand each revenue source Indicator Subset and plan for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

x. Task 4.12 - Implement the Indicator Subset for each revenue source (5/1/73-6/30/73);

y. Task 5.2 - Continue to implement, evaluate and modify the Division level Planning Susbsystem Procedures (5/1/71-6/30/72);

z. Task 5.4 - Implement the Division level Planning Subsystem Procedures (5/1/72-6/30/73);

aa. Task 5.5 - Evaluate and modify the Division level Planning Subsystem Procedures and prepare for the 1973-74 Division Planning Cycle (7/1/72-6/30/73);

bb. Task 5.6 - Implement the Division level Planning Subsystem Procedures (5/1/73-6/30/73);

cc. Task 5.9 - Continue to evaluate and modify the Subsystem Procedures for each revenue source and continue preparations for the second implementation period for each source (7/1/71-6/30/72);

dd. Task 5.10 - Implement the Subsystem Procedures for each revenue source (5/1/72-4/30/73);

ee. Task 5.11 - Evaluate and modify the Subsystem Procedures for each revenue source and prepare for the 1973-74 Division Planning Cycle (5/1/72-6/30/73); and

ff. Task 5.12 - Implement Subsystem Procedures for each revenue source (5/1/73-6/30/73).

Results at the End of Each Phase

The work program has been so conceived as to yield working components for the Planning System at the end of Phases I and II. All components will be cleaned up during Phase III and turned over to the Division personnel in complete working order at the end of the Phase. The following results will be produced at the end of each phase:

1. Phase I (7/1/70-4/30/71) --

   a. Forecast Procedures,

   b. Report Generation Procedures,

   c. General Data and Information Files,

   d. General Indicator Subsets,

   e. Division Planning Subsystem Procedures,

   f. Revenue Source Planning Subsystems, Data and Information Files, Indicator Subset, and Planning Procedures will be completed for each of seven revenue sources -- (1) Division Budget, (2) State Grants-in-Aid, (3) Vocational Education Act Amendments of 1968, (4) Civil Defense Education Act Amendments of 1950, (5) Adult Basic Education Act Amendments of 1966, (6) Veterans Administration, and (7) Special Projects,

   g. Procedures and documentation manuals and materials will be developed for the above where necessary, and

h. Division personnel using the above components will be trained in their use;

2. Phase II (5/1/71-4/30/71) --

a. The following components will have nearly completed the first implementation, evaluation and modification process -- (1) Forecast Procedures, (2) Report Generation Procedures, (3) General Data and Information Files, (4) General Indicator Subset, and (5) Division Planning Subsystem Procedures,

b. Revenue Source Planning Subsystems - Data and Information Files, Indicator Subsets, and Planning Procedures will be completed for each of the following sources -- (1) Manpower Development and Training Act Amendments of 1969 and (2) Social Security Act Amendments of 1967,

c. Procedures and documentation manuals and materials will be developed for the two revenue source Planning Subsystems mentioned in "b" above,

d. Division personnel using the revenue source Planning Subsystems mentioned in "b" above will be trained in their use, and

e. All continuing and non-continuing revenue source Planning Subsystems will have completed their first implementation evaluation and modification process; and

3. Phase III (5/1/72-6/30/73) --

   a. Final modifications will be completed on all the components of the Planning System,

   b. Procedures and documentation manuals and materials will be completed,

   c. All division personnel will complete their training in the use of the components of the Planning System, and

   d. All components of the Planning System will be operational.

Concluding Comments

Because of the large number of revenue sources presently administered by the Division and the complexity of the required LEA and State application process for requesting funds from these sources, the Division has an immediate need for a continuous, comprehensive, and integrated Planning System. The work program contained in this chapter will provide the components of the proposed Planning System thirteen months after the start of development. This rapid delivery, however, is predicated on the assumption that these components will be subjected to two implementation, evaluation and modification processes, that is, the components will be used to assist the Division in completing two of its planning cycles (1971-72 and 1972-73). The use of the components during these cycles will reveal problems within and

among the components that may be overlooked during their development. The Planning System will be free of problems and completely operational at the end of thirty-six months. The System will have been built with and for the personnel of the Division. All necessary procedures and documentation materials will have been completed. These materials plus the thorough training of the Division's personnel will enable the Division to upgrade the components of the System long after the Government Studies Center has completed its work.

APPENDIX A

Illustrative Computer Aid

NEW JERSEY VOCATIONAL EDUCATION PLANNING SYSTEM STUDY

AN ILLUSTRATIVE COMPUTER AID TO VOCATIONAL EDUCATION APPLICATION REVIEW AND SELECTION PROCEDURE

VERSION I - MODEL I

PREPARED BY

CHARLES I. GOLDMAN
BENJAMIN H. RENSHAW

ILLUSTRATIVE LOCAL EDUCATIONAL AGENCY AND APPLICATION DATA

APPLICATION CHARACTERISTICS				LOCAL AGENCY CHARACTERISTICS			
APPLICATION CODE	BEHAVIORAL INDEX DECILE	STUDENT OUTPUT	OCCUPATION	DROP-OUT RATE	UNEMPLOYMENT RATE	TAX EFFORT INDEX	TOTAL COST
R001	9	116	TECH ED	1.16	3.20	2.93	223000
R002	4	58	AGRIC	4.23	8.30	2.18	67800
R003	10	97	HLTH OCC	8.55	13.20	3.32	115000
R004	5	63	HLTH OCC	3.63	4.60	2.29	55555
R005	8	54	TECH ED	2.04	4.40	1.15	29425
R006	2	79	AGRIC	1.87	7.60	0.29	65000
R007	1	59	TECH ED	1.69	13.60	3.30	21750
R008	10	136	AGRIC	2.98	3.90	0.40	96340
R009	9	85	HLTH OCC	3.56	7.30	2.73	15000
R010	7	47	HLTH OCC	2.21	3.80	0.64	8750
R011	3	101	TECH ED	1.29	12.00	2.53	68000
R012	5	60	TECH ED	6.12	12.10	1.34	17575
R013	8	85	AGRIC	2.33	5.90	2.03	26000
R014	1	71	AGRIC	1.32	9.50	0.90	12000
R015	7	80	TECH ED	4.79	11.30	3.16	46290
N001	4	23	HLTH OCC	8.00	5.50	1.91	9500
N002	3	113	AGRIC	2.73	10.00	0.69	33650
N003	6	176	AGRIC	5.54	3.00	3.54	163750
N004	6	53	HLTH OCC	2.46	3.40	1.61	34650
N005	2	17	HLTH OCC	6.73	14.40	2.61	16375

ABSOLUTE DATA TO DECILES - CONVERSION TABLES

	1	2	3	4	5	6	7	8	9	10
STUDENT OUTPUT - AGRIC	60	70	80	90	100	120	140	160	180	200
STUDENT OUTPUT - HLTH OCC	10	20	30	40	50	60	70	80	90	100
STUDENT OUTPUT - TECH ED	30	40	50	60	70	80	90	100	120	140
DROP-OUT RATE	1.35	1.70	2.05	2.40	2.75	4.20	5.65	7.10	8.55	10.00
UNEMPLOYMENT RATE	3.60	4.20	4.80	5.40	6.00	7.80	9.60	11.40	13.20	15.00
TAX EFFORT INDEX	0.52	0.87	1.22	1.57	1.92	2.27	2.62	2.97	3.32	3.67

COMPUTATION OF OVERALL INDEX FOR ILLUSTRATIVE LOCAL EDUCATIONAL AGENCY AND APPLICATION DATA

OVERALL WEIGHTS	0.25000	0.25000	0.16667	0.16667	0.16666		
APPLICATION CODE	BEHAVIORAL INDEX DECILE	STUDENT OUTPUT DECILE	DROP-OUT DECILE	UNEMPLOYMENT DECILE	TAX EFFORT DECILE	OVERALL INDEX	TOTAL COST
R001	9	9	1	1	8	6.17	223000
R002	4	1	7	7	6	4.58	67800
R003	10	10	9	9	9	9.50	115000
R004	5	7	6	3	7	5.67	55555
R005	8	4	3	3	3	4.50	29425
R006	2	3	3	6	1	2.92	65000
R007	1	4	2	10	9	4.75	21750
R008	10	7	6	2	1	5.75	96340
R009	9	9	6	6	8	7.83	15000
R010	7	5	4	2	2	4.33	8750
R011	3	9	1	9	7	5.83	68000
R012	5	4	8	9	4	5.75	17575
R013	8	4	4	5	6	5.50	26000
R014	1	3	1	7	3	2.83	12000
R015	7	6	7	8	9	7.25	46290
N001	4	3	9	5	5	4.92	9500
N002	3	6	5	8	2	4.75	33650
N003	6	9	7	1	10	6.75	163750
N004	6	6	5	1	5	4.83	34650
N005	2	2	8	10	7	5.17	16375

RANKING OF ILLUSTRATIVE APPLICATIONS BY OVERALL INDEX

RANK	APPLICATION CODE	OVERALL INDEX	TOTAL COST	CUMULATIVE BUDGET
1	R003	9.50	115000	115000
2	R009	7.83	15000	130000
3	R015	7.25	46290	176290
4	N003	6.75	163750	340040
5	R001	6.17	223000	563040
6	R011	5.83	68000	631040
7	R012	5.75	17575	648615
8	R008	5.75	96340	744955
9	R004	5.67	55555	800510
10	R013	5.50	26000	826510
11	N005	5.17	16375	842885
12	N001	4.92	9500	852385
13	N004	4.83	34650	887035
14	N002	4.75	33650	920685
15	R007	4.75	21750	942435
16	R002	4.58	67800	1010235
17	R005	4.50	29425	1039660
18	R010	4.33	8750	1048410
19	R006	2.92	65000	1113410
20	R014	2.83	12000	1125410

RANKING OF ILLUSTRATIVE APPLICATIONS BY RATIO OF OVERALL INDEX TO TOTAL COST

RANK	APPLICATION CODE	OVERALL INDEX	TOTAL COST	RATIO OF OVERALL INDEX TO TOTAL COST/50000	CUMULATIVE BUDGET
1	R009	7.83	15000	26.111	15000
2	N001	4.92	9500	25.877	24500
3	R010	4.33	8750	24.762	33250
4	R012	5.75	17575	16.359	50825
5	N005	5.17	16375	15.776	67200
6	R014	2.83	12000	11.806	79200
7	R007	4.75	21750	10.919	100950
8	R013	5.50	26000	10.577	126950
9	R015	7.25	46290	7.831	173240
10	R005	4.50	29425	7.647	202665
11	N002	4.75	33650	7.058	236315
12	N004	4.83	34650	6.974	270965
13	R004	5.67	55555	5.100	326520
14	R011	5.83	68000	4.289	394520
15	R003	9.50	115000	4.130	509520
16	R002	4.58	67800	3.380	577320
17	R008	5.75	96340	2.984	673660
18	R006	2.92	65000	2.244	738660
19	N003	6.75	163750	2.061	902410
20	R001	6.17	223000	1.383	1125410

COMPARISON OF RANKINGS OF ILLUSTRATIVE APPLICATIONS

APPLICATION CODE	RANK USING OVERALL INDEX	RANK USING RATIO OF OVERALL INDEX TO TOTAL COST
R001	5	20
R002	16	16
R003	1	15
R004	9	13
R005	17	10
R006	19	18
R007	15	7
R008	8	17
R009	2	1
R010	18	3
R011	6	14
R012	7	4
R013	10	8
R014	20	6
R015	3	9
N001	12	2
N002	14	11
N003	4	19
N004	13	12
N005	11	5

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PROGRAMMER AND APPLICATION DATA
DATE
PUNCHING INSTRUCTIONS
GRAPHIC
PUNCH
PAGE 1 OF 2
CARD ELECTRO NUMBER*

COMM.	STATEMENT NUMBER	CONT.	FORTRAN STATEMENT	IDENTIFICATION SEQUENCE
			AGRIC HLTH OCCTECH ED	
	.25		.25 .16667 .16667 .16666	
	60		70 80 90 100 120 140 160 180 200	
	10		20 30 40 50 60 70 80 90 100	
	30		40 50 60 70 80 90 100 120 140	
	1.35		1.70 2.05 2.40 2.75 4.20 5.65 7.10 8.55 10.0	
	3.6		4.2 4.8 5.4 6.0 7.8 9.6 11.4 13.2 15.0	
	.52		.87 1.22 1.57 1.92 2.27 2.62 2.97 3.32 3.67	
	20			
R001			9 116 3 1.16 3.2 2.93 223000	
R002			4 58 1 4.23 8.3 2.18 67800	
R003		10	97 2 8.55 13.2 3.32 115000	
R004			5 63 2 3.63 4.6 2.29 55555	
R005			8 54 3 2.04 4.4 1.15 27425	
R006			2 79 1 1.87 7.6 .29 65000	
R007			1 59 3 1.69 13.6 3.30 21750	
R008		10	136 1 2.98 3.9 .40 96340	
R009			9 85 2 3.56 7.3 2.73 15000	
R010			7 47 2 2.21 3.8 .64 8750	
R011			3 101 3 1.29 12.0 2.53 68000	
R012			5 60 3 6.12 12.1 1.34 17575	
R013			8 85 1 2.33 5.9 2.03 26000	
R014			1 71 1 1.32 9.5 .90 12000	
R015			7 80 3 4.79 11.3 3.16 46290	

*A standard card form, IBM electro 888157, is available for punching statements from this form

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PROGRAM	ILLUSTRATIVE LOCAL EDUCATIONAL AGENCY	PUNCHING INSTRUCTIONS	GRAPHIC								PAGE 2 OF 2
PROGRAMMER	AND APPLICATION DATA	DATE	PUNCH								CARD ELECTRO NUMBER*

COMM	STATEMENT NUMBER	CONT	FORTRAN STATEMENT	IDENTIFICATION SEQUENCE
	1 2 3 4 5	6	7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72	73 74 75 76 77 78 79 80
	N001		4 23 2 8.00 5.5 1.91 9500	
	N002		3 113 1 2.73 10.0 .69 33650	
	N003		6 176 1 5.54 3.0 3.54 163750	
	N004		6 53 2 2.46 3.4 1.61 34650	
	N005		2 17 2 6.73 14.4 2.61 16375	

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